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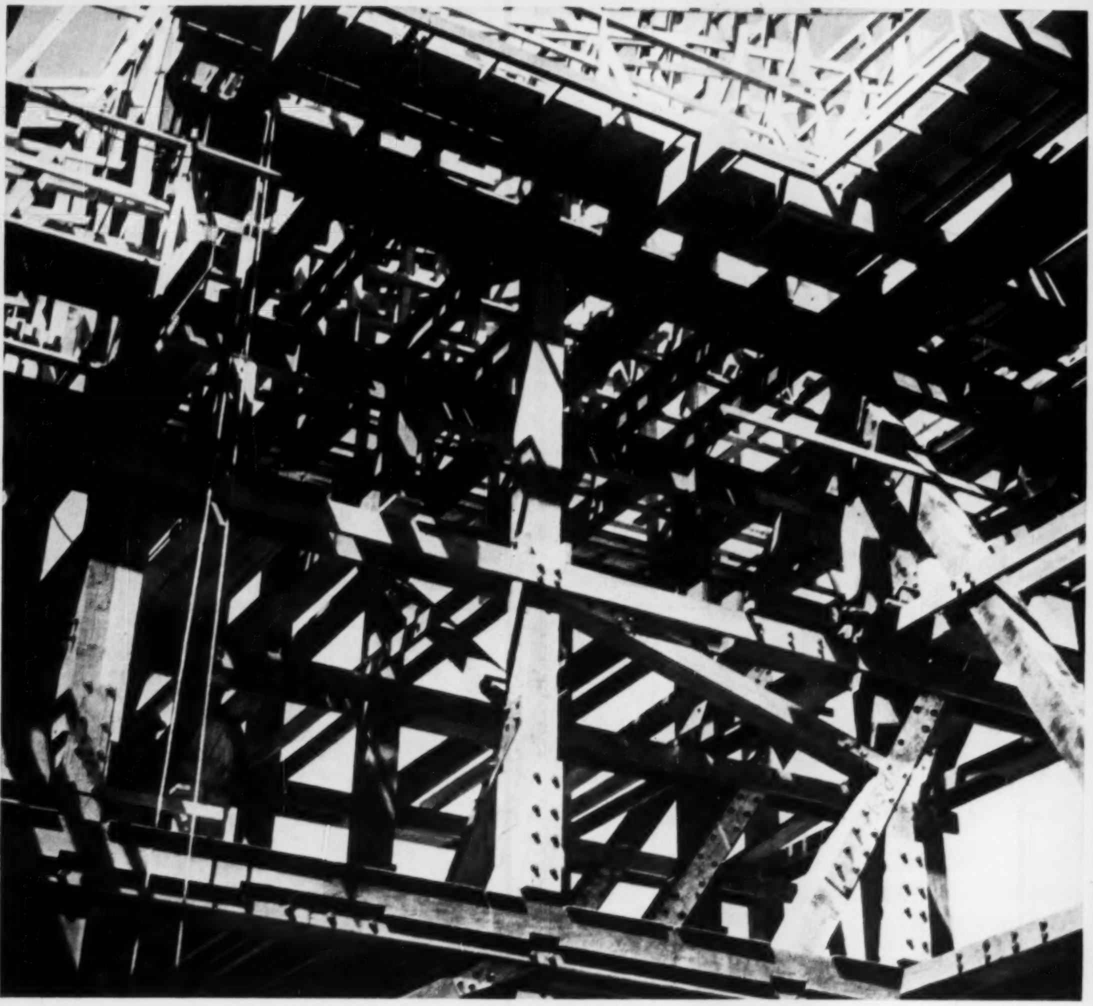

This massive structure is falsework for a concreting job *p. 40*

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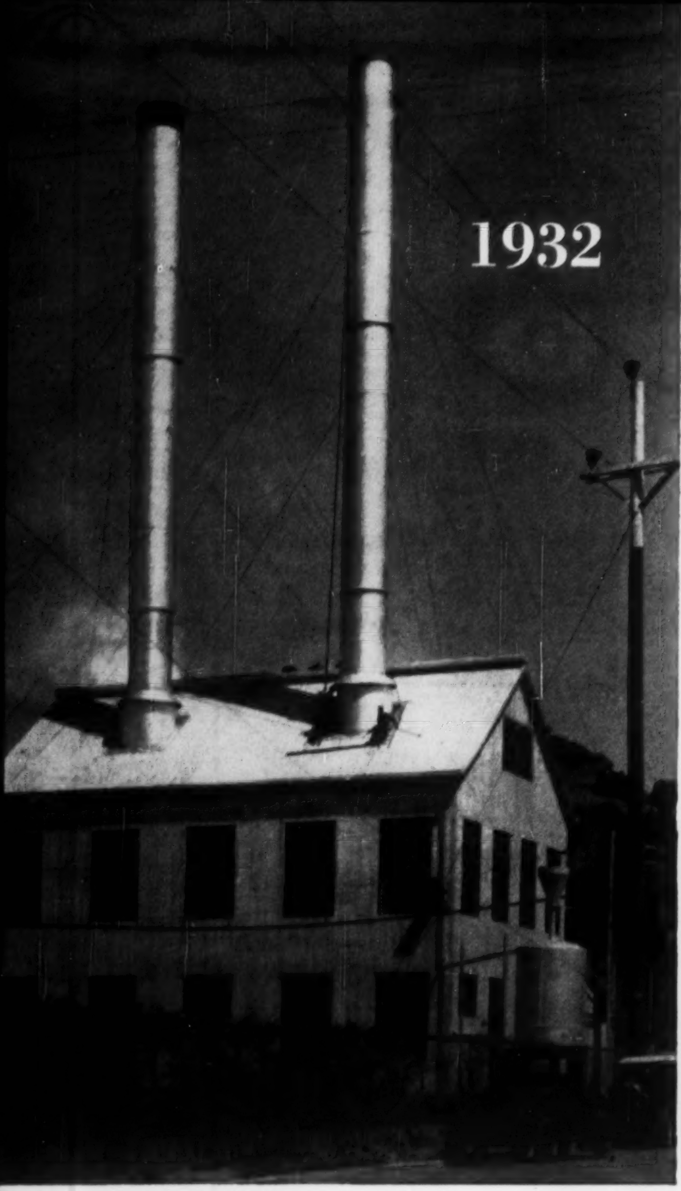
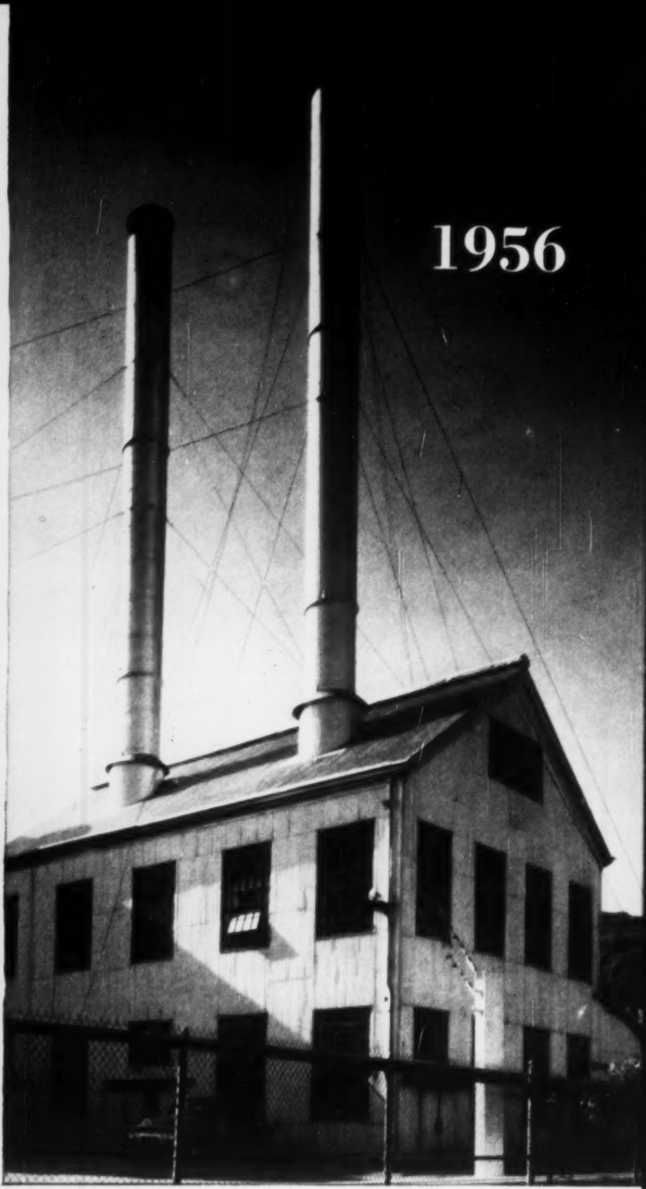


1932



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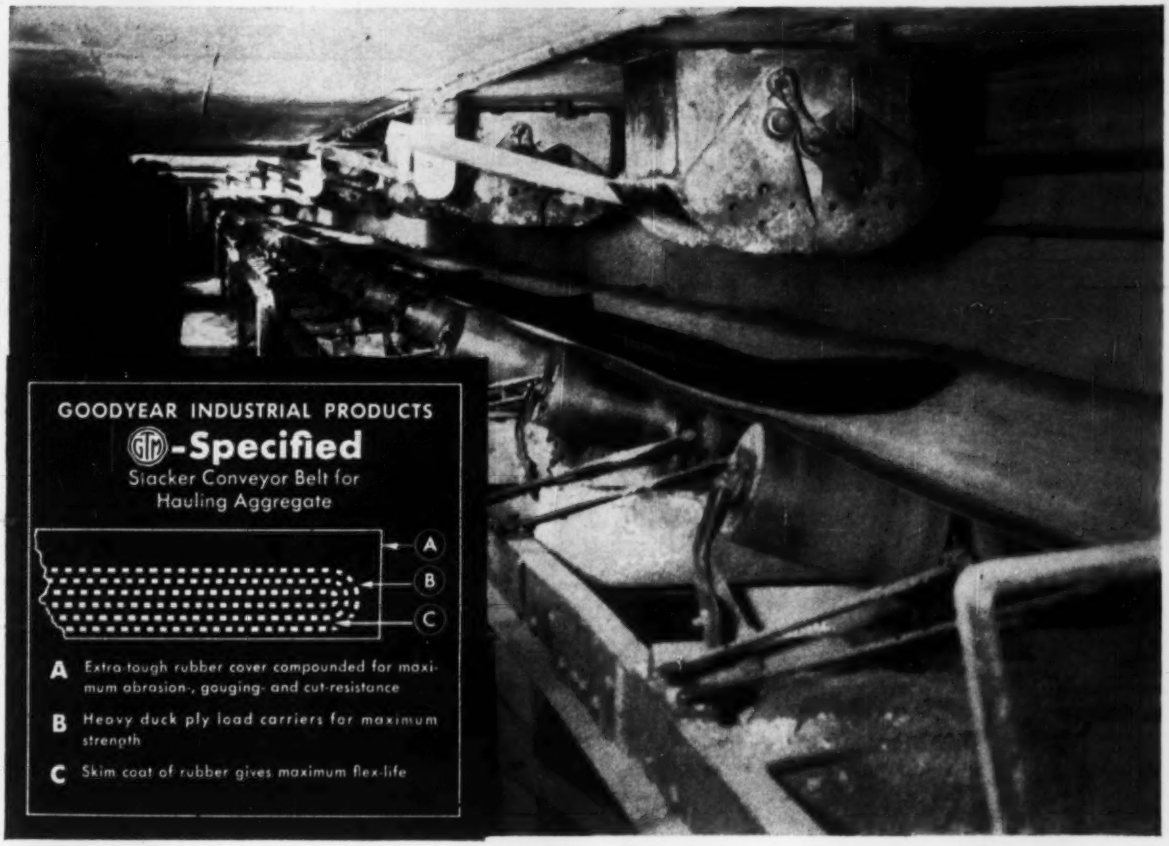
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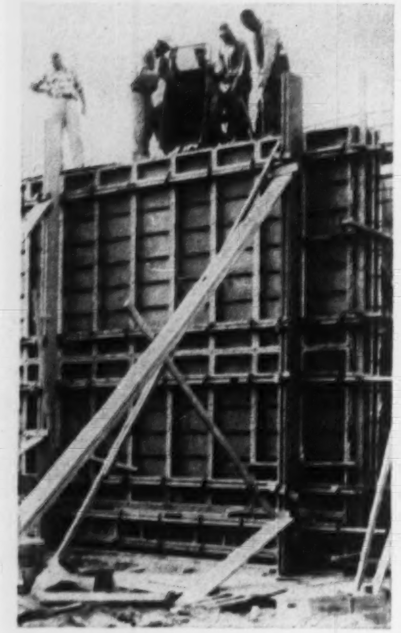

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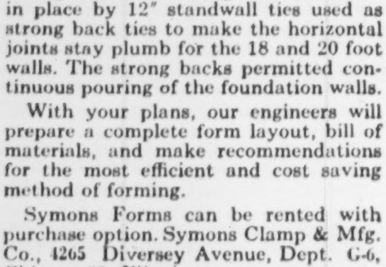

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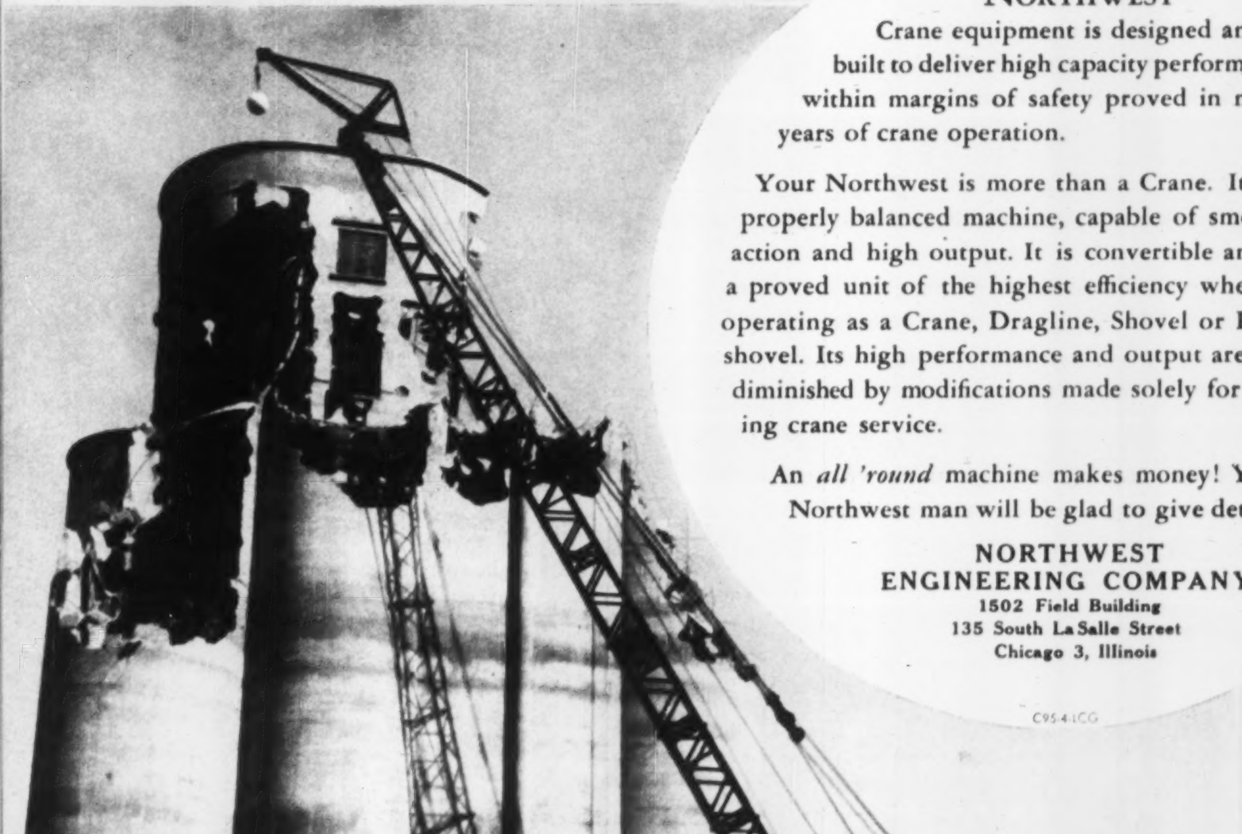

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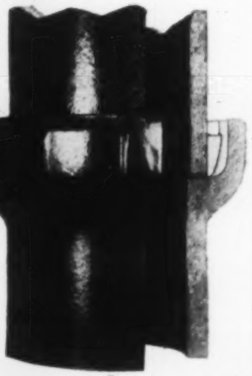

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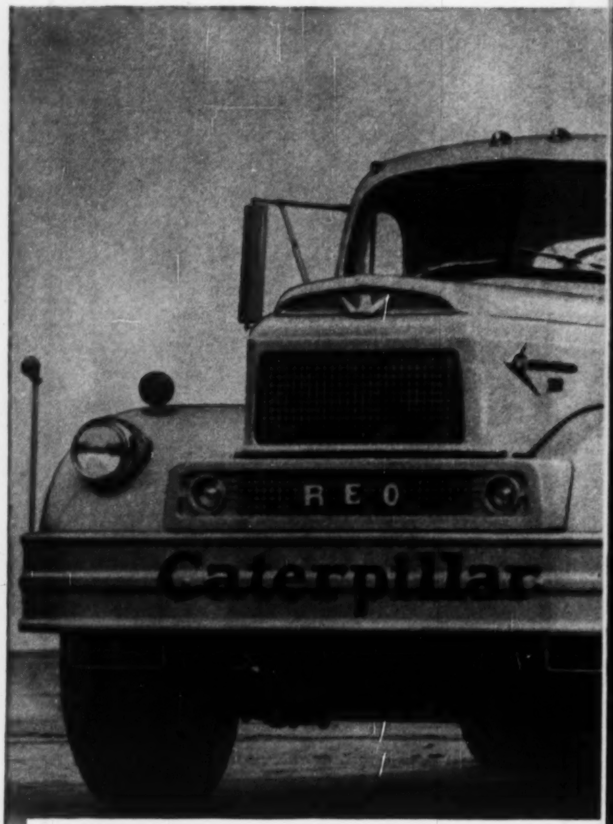

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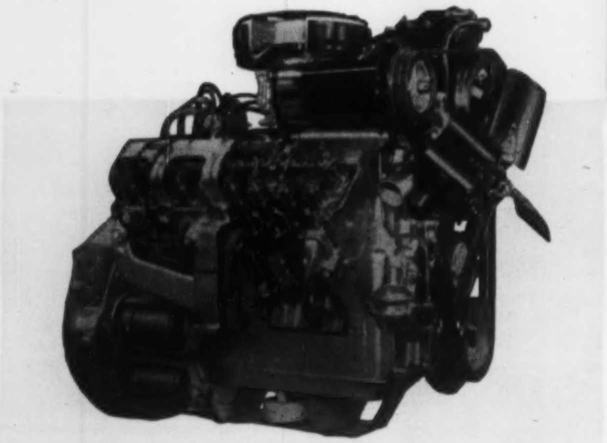

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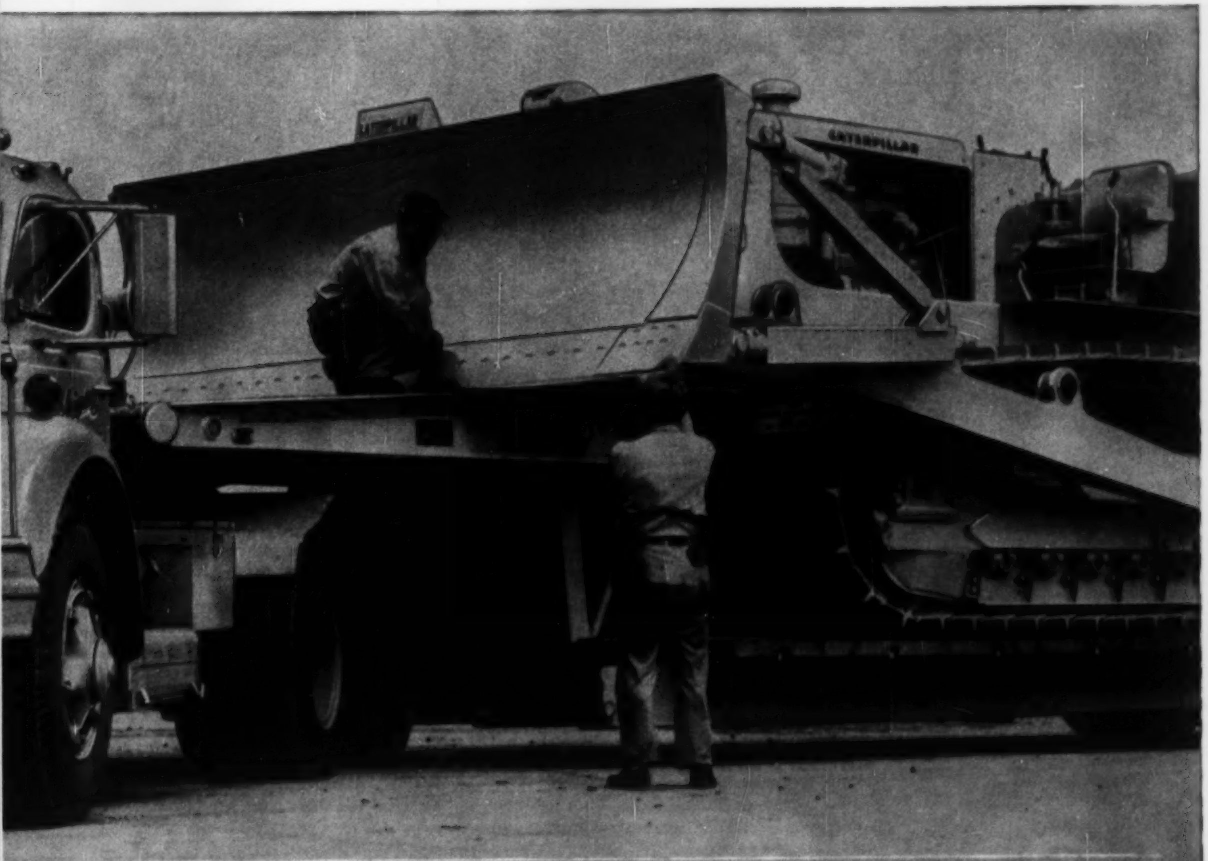
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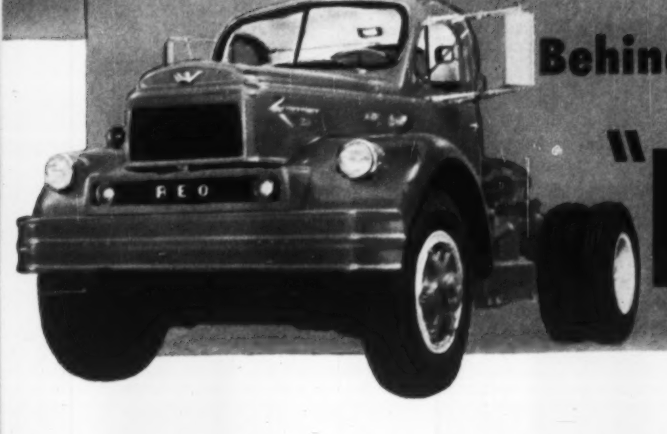

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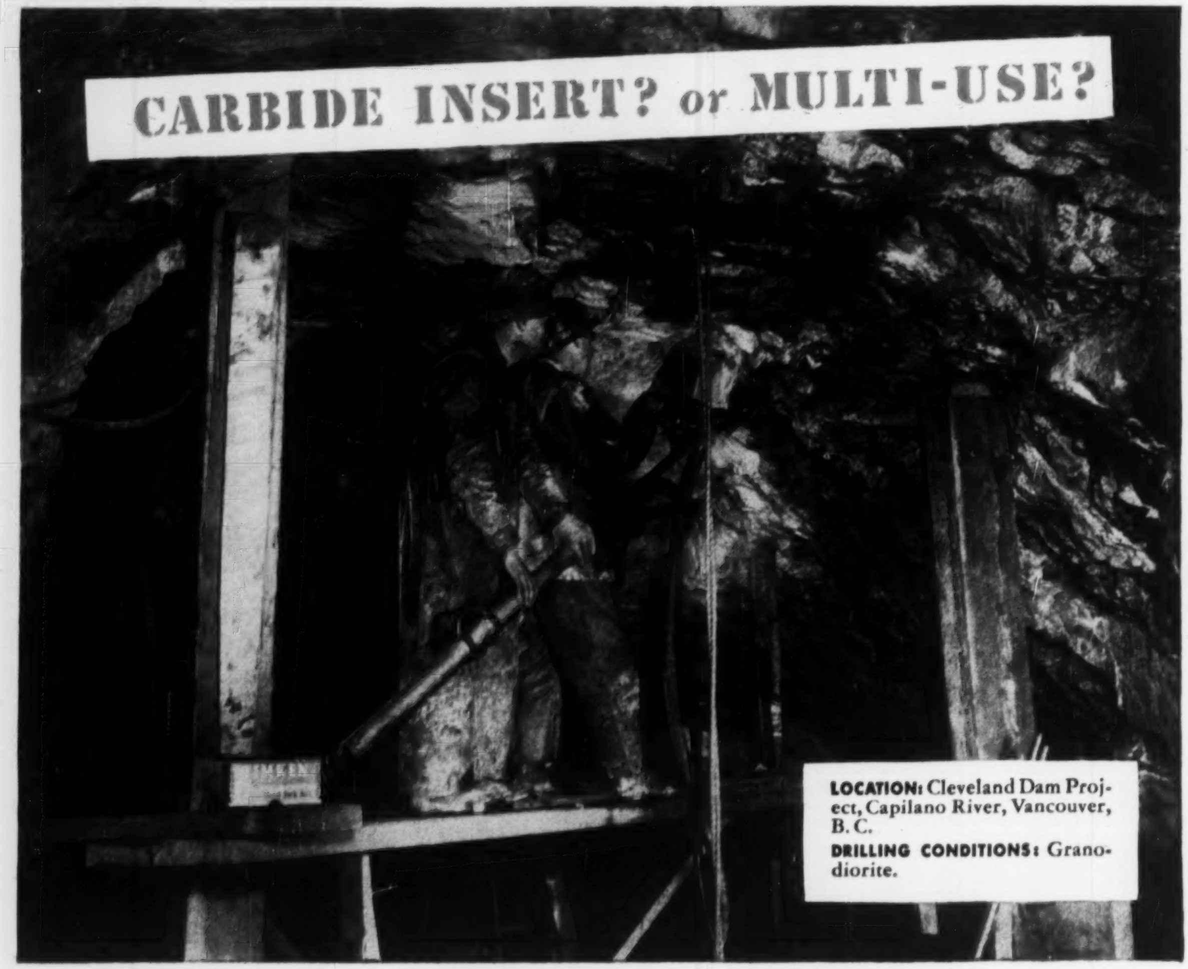

LOCATION: Cleveland Dam Project, Capilano River, Vancouver, B. C.
DRILLING CONDITIONS: Granodiorite.

TIMKEN® carbide insert bits chosen in competitive tests for Cleveland Dam

TO insure the best bit performance on the Cleveland Dam Project, Capilano River, Vancouver, B.C., the contractor chose his bits through competitive tests. Several other makes of rock bits were tested, but Timken® carbide insert bits won out. They were used from the start of the job to the finish.

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Reader Comment

More on ENR Conference

SIR—Thank you for the copy of Engineering News-Record containing the report on the recent conference in St. Louis on federal grants for sewage treatment works construction and your editorial, "Moving Too Fast" (ENR June 7).

Although there have been sharp differences as to the best means of bringing about a higher level of treatment works construction, it is gratifying that the importance of controlling pollution is coming to be so well recognized as is evidenced by discussions like that in St. Louis.

The problem of water pollution is one of national as well as state and local concern. As I see it, the federal government therefore should support state and local efforts to abate pollution. This has been the position of the Administration throughout the history of the legislation to extend and improve the Water Pollution Control Act of 1948. At the same time, we have stressed the need for the kind of program which will maintain state and local initiative. This, it seems to me, should be a prime objective of all those who seek a real solution to this troublesome and important problem. I know from your editorial that this is your view.

Engineering News-Record is to be commended for sponsoring this forum and helping to focus attention on some of the issues of this important problem.

ROSWELL B. PERKINS
Assistant Secretary
Department of Health, Education and Welfare
Washington, D. C.

SIR—I have read and studied your timely technical journalistic scoop on federal aid for sewage works in the June 7 issue and conclude:

1. Effective countrywide sewage works construction requires cooperation of government and industry on federal, state, city, and local levels. Each agency has something of value to contribute, and such contribution involves both money and effort.
2. This is an age of "money talks." However well-meaning effort may be, unless it is backed by money it is not effective. Overall federal effort, backed even with comparatively small grants, has had beneficial influence on nationwide sewage works construction under PWA, WPA and World War II construction programs. To those who have any doubts, it is suggested they read pages 155-166 of "America Builds—The Record of PWA."

May you have more such worthwhile and carefully prepared meetings.

ISADOR W. MENDELSOHN
Sanitary Engineer
Washington, D. C.

Shear Keys Are Useless

SIR—The article, "No Shear Keys Are Needed Here" (ENR June 7, p. 51), reporting the Tampa, Fla., test of a prestressed beam stem combined with a poured slab, revealed the complete uselessness of shear keys in the joint between the two parts.

In TRANSACTIONS, ASCE, 1914, Vol. 177, p. 1499, tests of 28 concrete beams are reported which similarly show the same uselessness of shear keys.

But even if they are useless, what then? It must not be forgotten that shear keys have become an almost basic detail of concrete design. Hundreds of thousands of them have been formed, year after year; behind them is some of that same vast inertial force that keeps the moon swinging round the earth. It is easier to continue than it is to stop.

So even though shear keys are thus shown to be useless, the most interesting thing of all will be to observe the effects of this information upon the engineering world. Change must not be expected to come about suddenly, or abruptly; but on the other hand, can it be expected to come at all? Time will tell. However, don't overlook the fact that one solemn book of rules now says, "When a construction joint is required between the slab and the stem of the beams, shear keys shall be **designed" etc.**

Whatever the outcome, thanks are assuredly due Dean and Ozell for this very fine and truly valuable piece of investigative work. The writer would tender his to them, here and now.

HOMER M. HADLEY
Consulting Engineer
Hadley & Hadley
Seattle, Washington

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

Letters should be addressed: Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Swiss Dam Ahead of Schedule

SIR—I have read with great interest the article entitled "Swiss Take Over High Dam Leadership," (ENR May 24, 1956, p. 34). It is mentioned there that Mauvoisin Dam was originally scheduled to be finished in 1959, but, owing to the collapse of its concrete plant, it was delayed a full working season. This is not quite accurate.

As mentioned in your article, Mauvoisin Dam is located in a valley of the Swiss Alps at an elevation of about 5,500 ft. Under normal weather conditions, it is possible to place concrete only from the beginning of May to the end of October. The tragic collapse of the concrete plant happened on September 25, 1954, i.e., very close to the end of the working season. The setback, therefore, amounted to only about a month of the 1954 season.

During the winter 1954-55 the contractor managed to have the concrete plant reconstructed to be ready again for May, 1955. During the 1955 season, he succeeded in placing more concrete in the dam than scheduled, making up for the loss of 1954 and even getting ahead of the working schedule.

I believe that during the next few years, it will also be possible to place more concrete than scheduled, and I hope that Mauvoisin Dam will be completed by the end of 1958.

A fact not mentioned in the article is that Electro-Watt Electrical and Industrial Management Co., Ltd., Zurich, is the firm responsible for both the design and the supervision of the project.

A. WINIGER
Managing Director
Electro-Watt, Entreprises Electriques et Industrielles, S.A.,
Zurich, Switzerland.

Driving Abates Pile Friction

SIR—Reference is made to the interesting comments of reader E. J. Zegarra, relative to the story of H-pile tests (ENR, Apr. 5, p. 90). One cannot but agree with the suggestion that a foundation designer should use some common sense, best judgment, and a reasonable factor of safety in designing foundations. Tests such as that reported on the steel H-beam piles in Chicago are not intended as a substitute for judgment, but rather should be used as an aid in its application.

Not all of Mr. Zegarras' comments can be so readily agreed with. He

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points out what appears to him a paradox, in that friction forces were developed along the pile after driving, whereas they were substantially absent during driving. It appears that this confusion results from Mr. Zegarra's premise that it is a "widely known and commonly accepted fact" that a complete remolding of the soil is effected by the action of a pile during driving. While this may be true for displacement piles, the fact that it is not necessarily true for H-piles is attested to by the borings taken immediately adjacent to an H-beam pile following driving, which indicated that very little remolding had taken place. Notwithstanding, during the driving very little frictional restraint was recorded by the strain gages placed at intervals along the embedded length of the pile. On the other hand, after driving was completed and during the subsequent static load testing, frictional forces predominated over the bearing force at the pile tip.

The essential point that these results indicate is that the transfer of load to the soil is entirely different during loading than during driving, hence a dynamic pile formula gives safe results for static loading mainly through the use of a healthy factor of safety. To attempt an explanation by stating that "the resistance of soils under dynamic loads is two to five times larger than under static loads" is an oversimplification that entirely neglects the fundamentally different physical situation.

Because of the entirely different mechanisms existing in driving and static testing of piles, the hope was expressed that pile capacity may one day be determined by laboratory shear tests, since one is at least herein using a comparable physical model. Otherwise, it is feared that principal reliance must continue to be placed on the "factor of ignorance".

R. L. JANES
Armour Research Foundation
Illinois Institute of Technology
Chicago, Ill.

CALENDAR

Society for Experimental Stress Analysis, annual meeting and exhibit, Deshler-Hilton Hotel, Columbus, Ohio, Nov. 1-2.

Noise Abatement Symposium, seventh annual meeting, Hotel Sherman, Chicago, Ill., Oct. 11-12.

Sixth Annual Drilling Symposium, The University of Minnesota, Minn., October 11, 12, 13, 1956.

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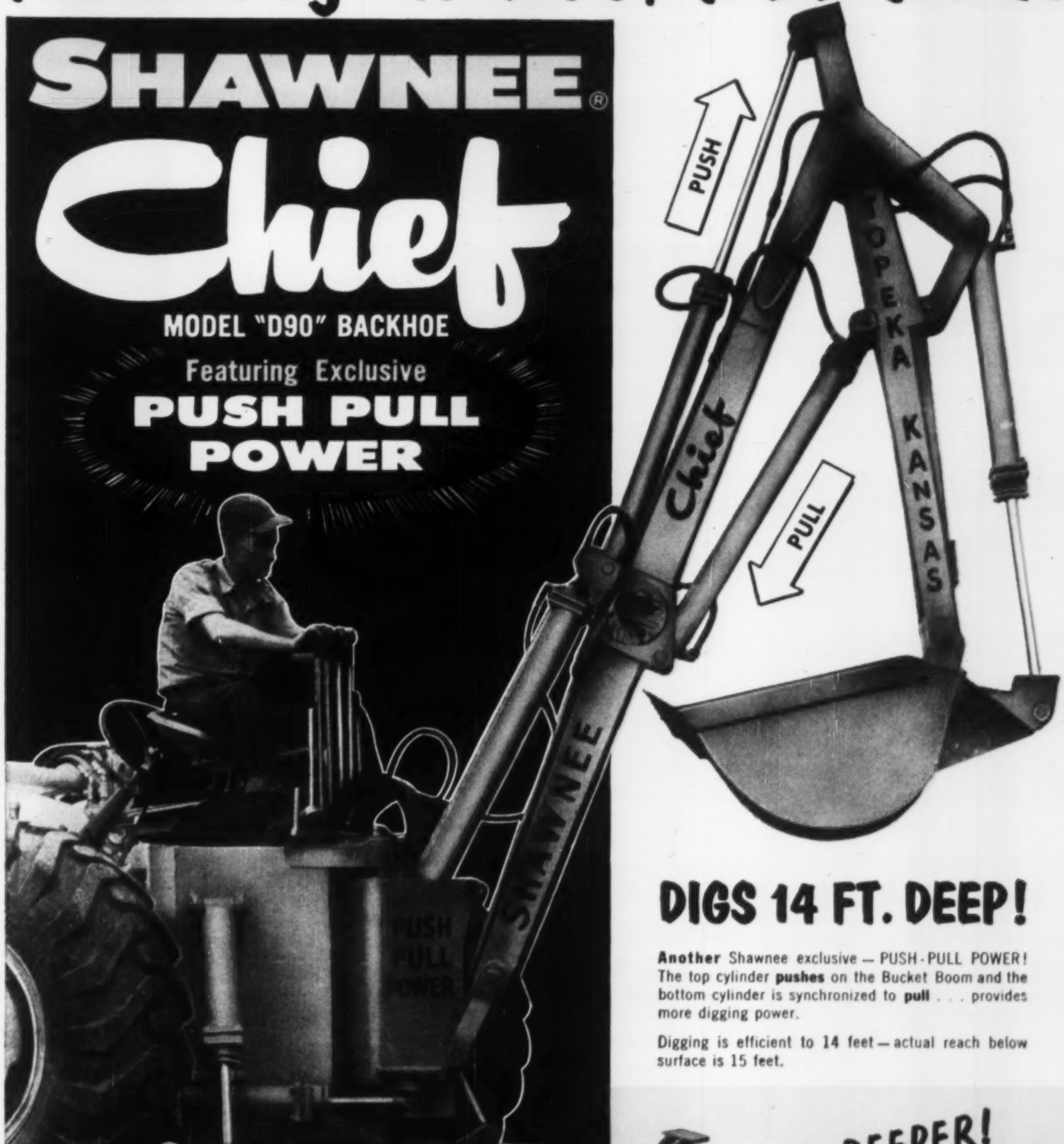
SHAWNEE® Chief

MODEL "D90" BACKHOE

Featuring Exclusive

PUSH PULL POWER



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- ★DIG DEEPER!
- ★REACH FURTHER!
- ★MORE POWER!

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Prove to yourself that FOAMGLAS is *your* ideal insulation!

Let us send you a free sample of FOAMGLAS. Use it to make the few simple tests illustrated. You'll prove that this unique cellular glass insulation has exactly the right combination of properties to assure you of these vital benefits: constant insulating efficiency . . . long, maintenance-free life . . . strength and rigidity for a variety of structural applications . . . ease of handling and installation.

Thousands of actual users have proved in actual performance the benefits so clearly demonstrated by these tests. No wonder, then, that new users every day are picking FOAMGLAS to insulate the roofs, ceilings, walls and floors of all types of buildings, low temperature spaces, piping and equipment. Send for a sample today and make your own tests. Use the handy coupon, or write . . .

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LIGHT WEIGHT — Just pick up your sample to see how light and easy to handle it is. Check actual weight on your company's postal scale if you wish. The density of FOAMGLAS is only 9 pounds per cubic foot.

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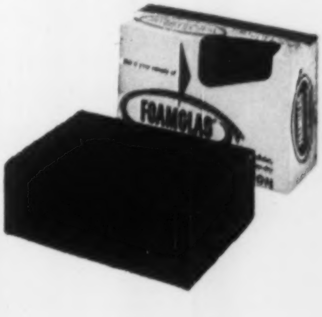

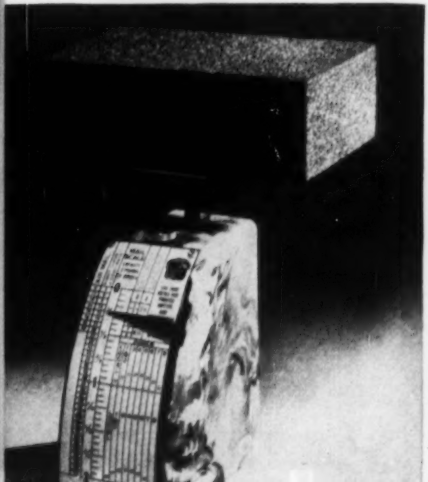

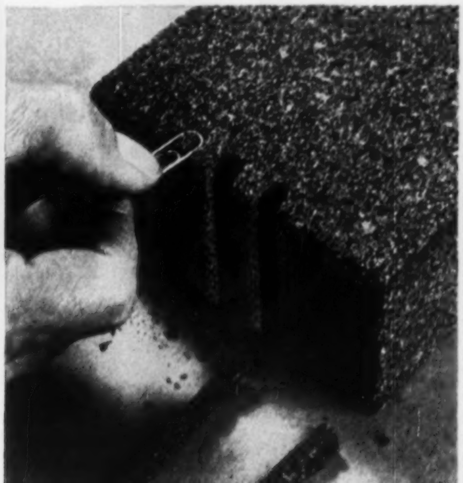

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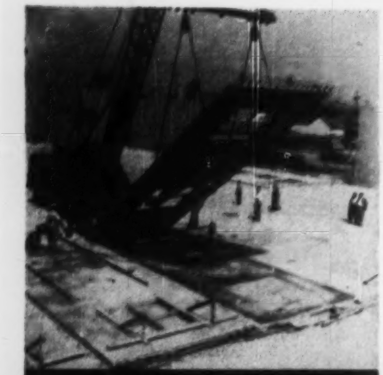
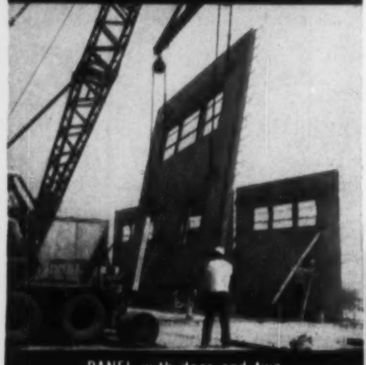


PRECAST PANEL 32' high, 18½' wide with two large window areas

TRUSS has 60' span at top

114,000 LB. SLAB being positioned



PANEL with door and two window areas

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Complete Accessories Plus Experience on Tilt-Up Jobs!

On every Tilt-Up job the proper type of Pick-Up Inserts and Brace Anchors as well as their location in the slab or precast structural member are of prime importance in order to withstand the stresses occurring when *tilting, lifting,* and *positioning.* As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures resulting from the experience of thousands of job applications.

SUPERIOR accessories are designed for fast and efficient handling of all types of precast panels and structural members. The Pick-Up Insert provides dependable anchorage for bolts which secure a lifting angle to which slings are attached when the panel is raised. Brace Anchors secure the temporary bolts by which the Braces are attached. The exclusive pivoting action of the adjustable Braces permits quick positioning and alignment of panels. Braces are assembled with 2 x 4's or pipe of lengths to fit job conditions.

The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete layout service provide a combination which offers safe and efficient handling of precast panels and structural members.

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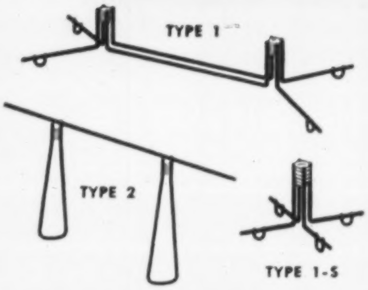
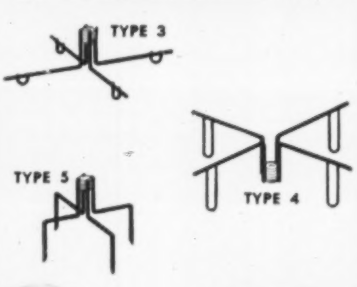
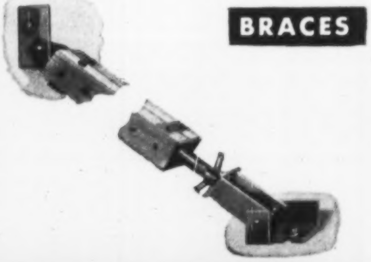


ANCHORS for BRACES



BRACES



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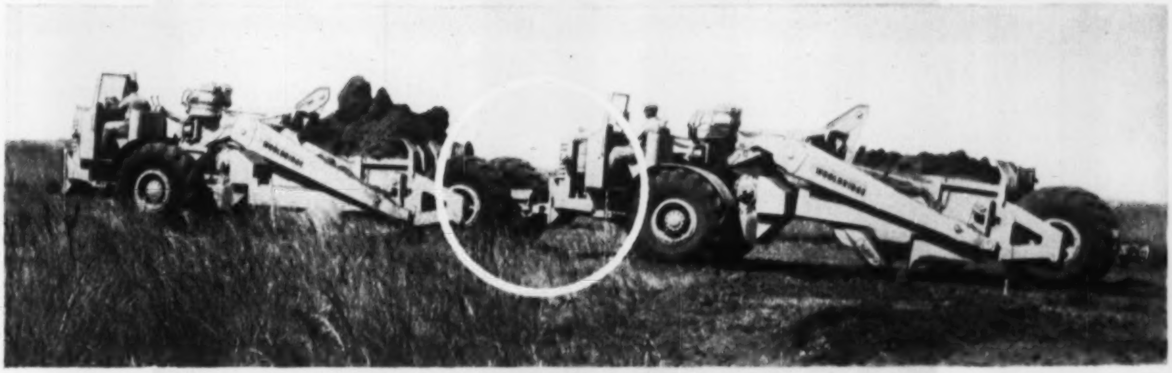
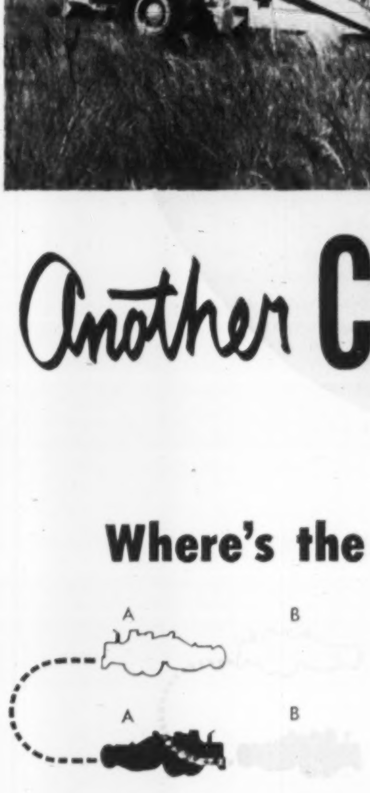
TEAM LOADING



Another COBRETTE *Exclusive*

Where's the crawler tractor in this picture?

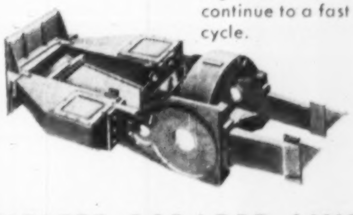


Entering pit, Cobrette "A" is *team loaded* with pusher assistance from Cobrette "B".

After quick turn-about with no lost motion, loaded Cobrette "A" helps "B" get a heaping load — then both continue to a fast haul cycle.

The crawler tractor is being put to profitable *use.*

These *Cobrettes* push loaded each other — working as a team in a *new* method of earthmoving operation made possible by their unique and exclusive design.



Rugged main frame and power train are specially designed to push in fast *team loading.*

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THE COMPLETE SCRAPER LINE

WOOLDRIDGE

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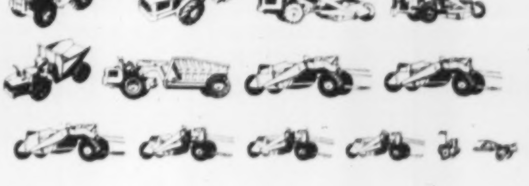
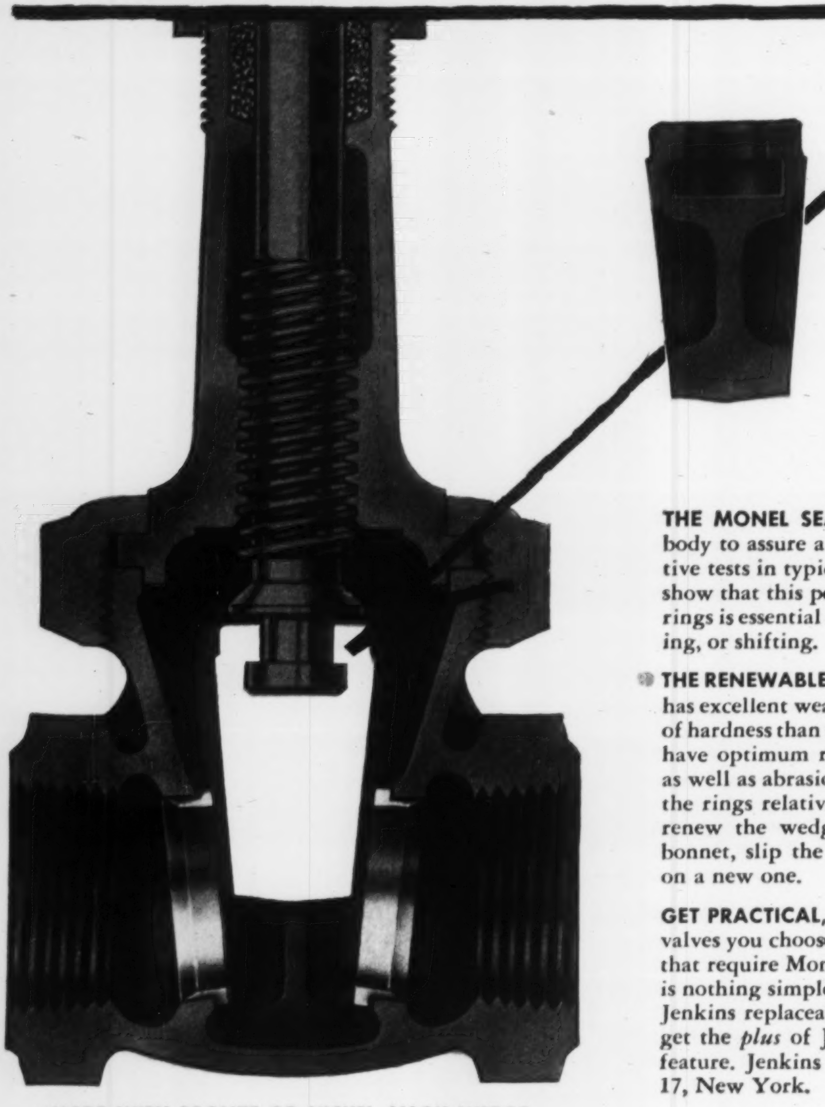


In JENKINS Monel-seated Bronze Gates

THE WEDGE* TAKES THE WEAR - *and spares the rings*



Easy replacement of the wedge only — right on the line — restores full efficiency

THE MONEL SEAT RINGS are expanded into the body to assure a positive, leak-proof joint. Exhaustive tests in typical monel-seated gate valve services show that this permanent all-around support of the rings is essential to guard against deforming, loosening, or shifting.

* **THE RENEWABLE WEDGE** (bronze or nickel alloy) has excellent wear resistance, but has a lower degree of hardness than the heat-treated Monel rings, which have optimum resistance to erosion and corrosion as well as abrasion. Thus, wear of the wedge leaves the rings relatively unaffected. When necessary to renew the wedge, you simply remove the valve bonnet, slip the old wedge off the stem, and slip on a new one.

GET PRACTICAL, LOW-COST RENEWABILITY in the valves you choose for the tough, punishing services that require Monel-seated gates. Compare . . . there is nothing simpler, faster, or more economical than Jenkins replaceable wedge design — and you also get the *plus* of Jenkins *extra value* in every other feature. Jenkins Bros., 100 Park Ave., New York 17, New York.

* **MADE WITH BRONZE OR NICKEL ALLOY WEDGE**

The bronze wedge provides lasting economy for most applications. The nickel alloy wedge provides extra resistance where rapid wear and corrosion are factors.

JENKINS BRONZE GATES WITH MONEL SEAT RINGS

200 psi	300 psi
Fig. 270-U, Bronze Wedge	Fig. 280-U, Bronze Wedge
Fig. 270-UN, Nickel Alloy Wedge	Fig. 280-UN, Nickel Alloy Wedge
Fig. 270-UL, Bronze Wedge, U.L. approved for L.P.G. Services	350 psi Fig. 280-UX, Bronze Wedge

JENKINS BRONZE GATES INCLUDE 40 DIFFERENT PATTERNS

125 • 150 • 200 • 300 • 350 psi SOLID WEDGE • SPLIT WEDGE
SCREWED • FLANGED • SOLDER END • SOCKET END QUICK OPENING

Call your local Jenkins Valve Distributor for complete information.

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LOOK FOR THE JENKINS DIAMOND
VALVES
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ENGINEERING NEWS-RECORD
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CONTENTS

NATIONAL AFFAIRS

The Interstate System: It's Okay to Go 21
Priest Rapids Goes Under Contract 22
Fast Repairs Made on Water Soaked Subway ... 23
Penn. Pike Cuts Truck Tolls, Car Rates Unchanged 23
State Plans for the Big Highway Program 24
Funds for Aswan & Hells Canyon Dams Denied .. 24
Cable Spinning Begins on Mackinac Straits Bridge 25
Site Shapes Up for Aluminum Plant 25
For Dredgers: 44,000,000 Yards to Go 26

FEATURES

Experts Pool Knowledge of Quake-Resistant Design 32
Massive Timber Tower for Cantilever Concreting . 40
New Hampshire Builds Two Tiny Turnpikes 48

NEW PRODUCTS

Sandwich Panels Carry Roof Loads 55
Spray Curing Machine Covers in One Pass 55
Z-Type Window Ventilates; Keeps Out Insects and Rain 55
Material Spreader for Use With Standard Dump Truck 56
German All-Purpose Hydraulic Shovel 57
Publications 58

INTERNATIONAL

American Joint Venture Gets Australian Dam Job 63
Floating Water Purification Plant for Iraq 63
Novel Bridge for the Rhine at Cologne 63
India Hydro Project Gets Canadian Financing ... 64
Cofferdam Built to Take Big Floods 64
Dutch Polder System for Rhodesian Project 65

MEN AND JOBS

H. T. Heald to Head Ford Foundation 66
Director for Ga. Tech Architecture School 66
New Architect-Engineer Firm Formed 66
Former District Engineer Joins Bridge Company .. 66

RESEARCH

More Money for Fresh-From-Salt Water Project .. 70
Longer Life for Asphalt Roofing 70
New Prediction Theories for Ultimate-Strength ... 70

BUSINESS AND FINANCE

Construction Feels the Steel Shortage 98
Bid-Erring Contractor Gets a Second Chance 99
Housing Starts Slide in June 100
Contractor Prices Up 100

LABOR

Four Big Strikes Are Settled 103
Montana Blocks Right-to-Work Proposal 103
Highway Program and the Unions' Four-Way Pact. 105
Force Account Work 105
Labor Starts to "Educate" in Politics 107

Reader Comment 9
Calendar 10
Washington Observer . 19
Obituaries 69
Legal 74
Books 76
Unit Prices 78
Materials Prices 80
Construction Reports .. 83
Scoreboard 97
Editorials 120

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

THANKS BUT NO THANKS—There's an interesting aspect to last week's announcement of a $15-million contract award for two Canadian firms for construction of the first stage of a new smelter for the Canadian British Aluminum Co., Ltd. at Baie Comeau, Quebec. The contract went to Anglin-Norcross Corp., Ltd. and Atlas Const., Ltd., both of Montreal.

The significance: The bids were by invitation, and it is known that at least two U.S. firms—Morrison Knudsen and MacLean-Grove declined to bid without official explanation. The reason could have been the uncertainty of steel shipments (see page 98) or the general resentment by U.S. firms against the increasing insistence by Canadians on a renegotiation clause in many contracts—through which the contractor must give back part of his profits if they are judged (by Canadians) to be more than "fair and equitable."

WHO RUNS THE PENN PIKE?—Pennsylvania's Attorney General Herbert B. Cohen this week nudged Gov. Leader's political fuss with the Pennsylvania Turnpike Commission into a new direction.

Said Cohen: Under existing law, the Highway Department is responsible for all maintenance of the turnpike system. Thus the Highway Department should designate locations of future pike extensions, supervise all construction and have the last word on right-of-way acquisition.

In effect, the opinion puts the Highway Secretary, Joseph J. Lawler—now an ex officio commission member—in a position to override the authority of Commission Chairman, G. Franklin McSorley.

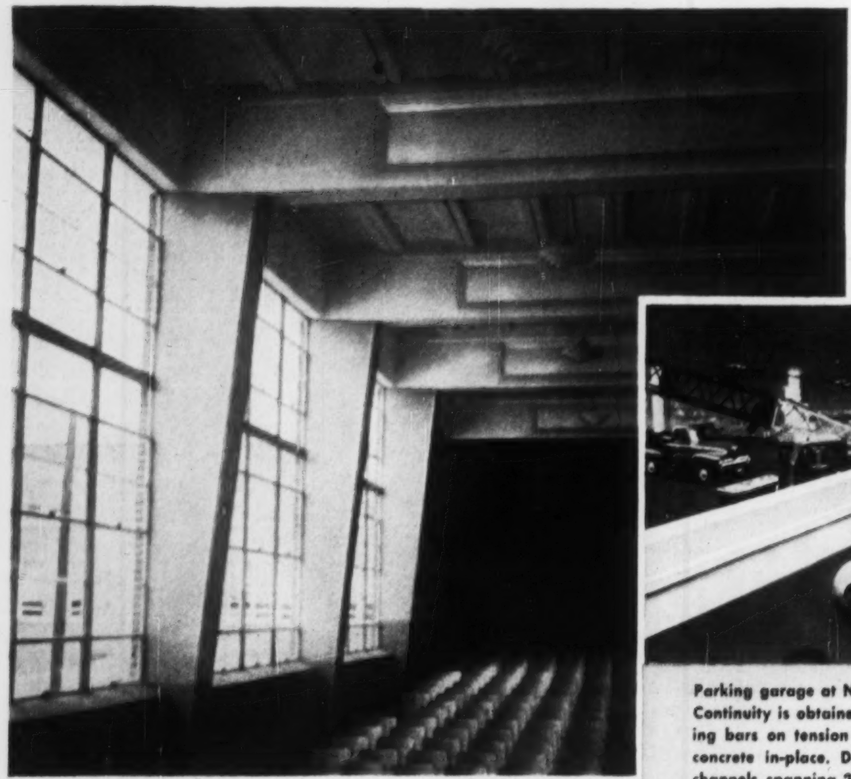
The latest move is one in a series in which the governor has tried to dominate the turnpike command with his own appointees. These attempts have been partially blocked by a recent court decision reinstating Commissioner Watson—who the governor had sought to remove—and reports of further feuding between Leader and McSorley—a Leader appointee.

WRIGHT'S NO ARCHITECT—Frank Lloyd Wright isn't quite T-square with the state where he maintains his winter home and workshop. In fact, Arizona doesn't legally recognize him as an architect because he never got around to registering.

But Wright won't be forced to take an examination to qualify—a written form and $25 are all that will be required. However, routine proceedings against him are under way and the famous designer faces a misdemeanor charge if he doesn't comply.

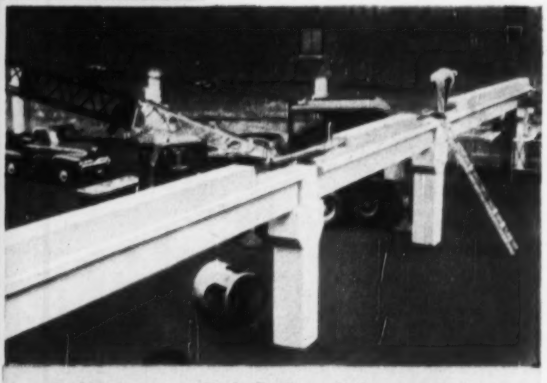
NEED A **RIGID** FRAME?

Use precast prestressed concrete!



A gymnasium at Lynchburg, Tennessee. Rigid frames on 20-ft. centers. Span 62 feet. Prestressed girder of rigid frame is 3 feet deep . . . connected to precast reinforced columns and made continuous by welding reinforcing bars projecting from each member. Deck between frames is 6-in. deep prestressed concrete channels.

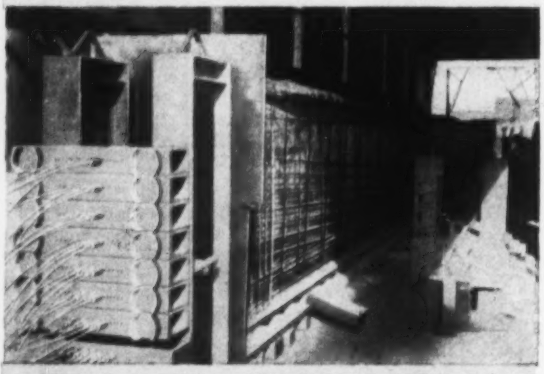
All structures illustrated were designed by Ross H. Bryan, Consulting Engineer . . . girders fabricated by T. L. Herbert & Sons . . . joists, slabs and channel decks fabricated by Nashville Breeko Block and Tile Company, all of Nashville, Tenn.



Parking garage at Nashville, Tenn. Girders span 38 feet. Continuity is obtained over columns by lapping reinforcing bars on tension side and pouring small amount of concrete in-place. Deck between girders is prestressed channels spanning 28 feet.

SINCE THE FIRST simple span bridge in the United States was completed in 1950, plant-fabricated prestressed concrete members have come a long way. As pictured here, all the advantages of continuous girders, rigid frames and long spans can now be combined with the economy and durability of precast pre-tensioned bonded prestressed concrete members.

Today, because of continuous development and participation in all types of prestressed projects, Roebling is the foremost supplier of tensioning elements in the industry. Why not turn to "headquarters" for suggestions and advice on specific applications? Write Construction Materials Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.



Girder for gymnasium at Milan, Tennessee. 100-ft. span girders 5½ feet deep spaced 20 feet on centers. 7-wire strands are deflected to approximate parabolic cable curve desirable on long spans. Strands are pre-tensioned, deflected, and then the concrete is poured. Deck is 8 inch x 12 inch prestressed block joists on 5-ft. centers and covered with precast lightweight slabs.

ROEBLING

Subsidiary of The Colorado Fuel and Iron Corporation CF&I

WASHINGTON OBSERVER

The fight over public housing is threatening the new housing law. In the rush for adjournment of Congress, almost anything can happen. The crucial issue:

Whether the House can force the Senate to take a smaller public housing program. Parliamentary maneuvering this week was aimed at forcing Senate Democrats to abandon a 135,000 units a year public housing program in favor of 70,000 in two years. The House threat: Take this or no new law at all. The lower figure probably will prevail, because these other housing provisions might be lost if a complete stalemate developed:

Continuing privately financed family housing for military bases, increasing the number to 200-thousand.

Lowering the minimum required of a seller of VA and FHA mortgages in purchasing stock of the Federal National Mortgage Association—from 3% to 1%.

Holding interest rates on college housing loans at the current level of ¼% above the going government rate. The Administration didn't want this.

Allowing up to 10% for risk and profit to builders of urban renewal. The legislation also gives more liberal returns for special urban projects.

Increasing home improvement loan guarantees to $3500 for five years, instead of $2500 for three years.

•

Water pollution abatement enforcement is getting strong backing. Mail coming in from around the country is heavy—as great an influx as any other issue dealing with money this year. Congress may override the Eisenhower Budget Bureau and give the Public Health Service all the $6 million to $7 million it wants to administer the law. The Budget Bureau had cut requests of the Health Education and Welfare Dept. from the larger figure to $3.1 million—and only $500,000 to run the new construction grants program.

Intercession by White House Chief of Staff Sherman Adams won another $1 million to the total. He stepped in after Welfare Secretary Folsom objected to the $3.1-million total. Now public health officials are getting a friendly reception in Congress with their request for more than $4.1 million.

Already, approval of $50 million for construction grants has been made. That money will go to cities for aid in construction of city sewage plants.

•

Building of satellite bases for B-52 bombers will be delayed. Congress, in finally voting funds for military construction projects, directed the Air Force to wait awhile, and study, before building dispersal installations at Dublin, Ga., Hobbs, N. M., and Mitchell, S. D. The Air Force wanted the fields so that strategic planes could be spaced away from possible central targets of attack.

•

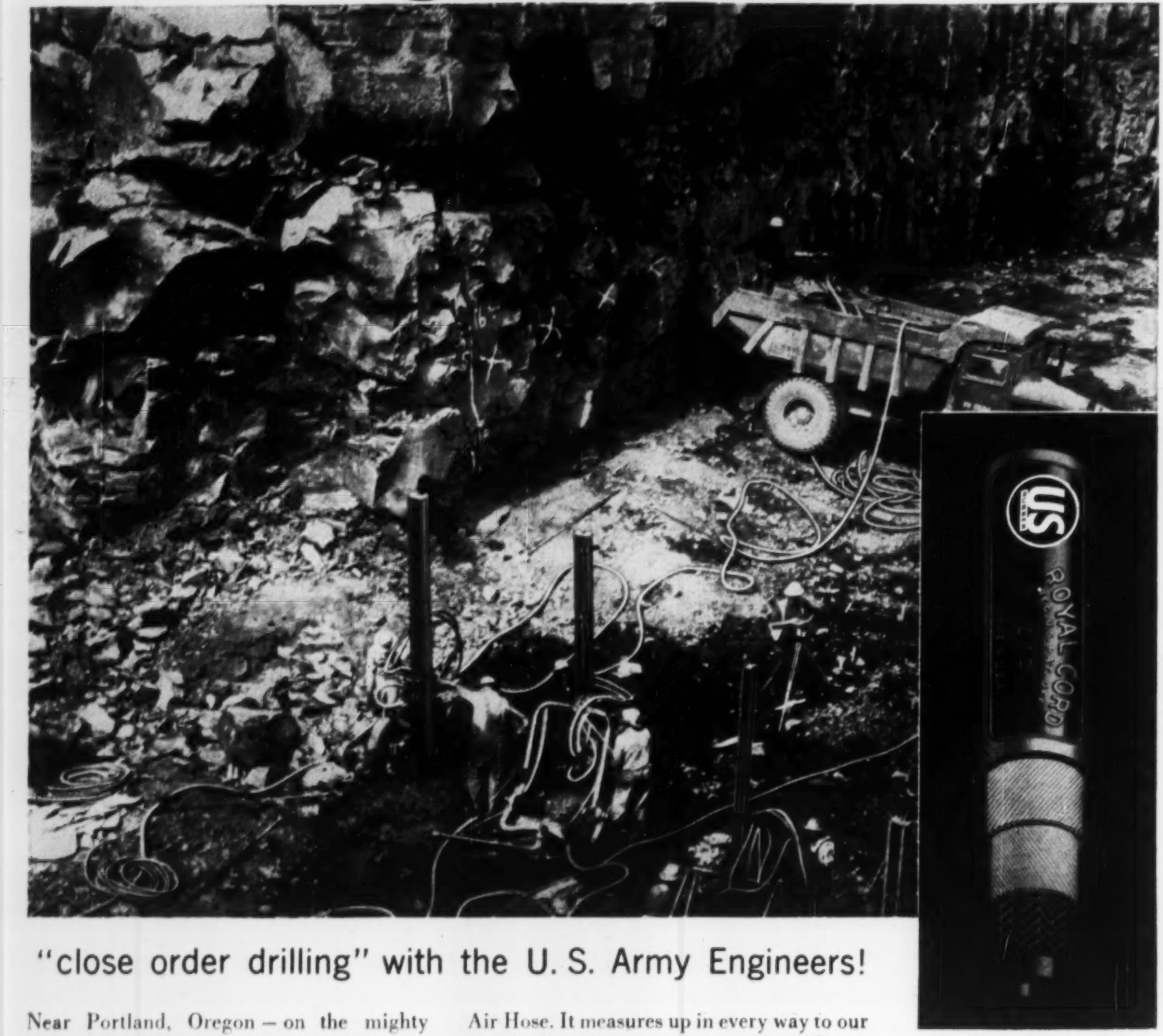
A new appointee to the National Labor Relations Board is expected soon. A Republican will be named to succeed Ivar Peterson, former aide to Sen. Wayne Morse, D. Ore., when Peterson's term expires in August. George Ives, son and administrative assistant to Sen. Irving Ives, R., N. Y., is the top man under consideration.

•

The drive to take control of the new road program away from BPR isn't as dead as it seemed to be last week. Last Monday, the Senate Public Works Committee approved an Administration-sponsored compromise that would create the new post of Highway Administrator. This administrator would be put in atop the present Commissioner of Public Roads—the commissioner remaining as a sort of "operating vice president."

Principal spark has come from Sen. Albert Gore, sponsor of the Senate version of the road bill. As head of a subcommittee holding hearings on administration of the highway program, he has repeatedly commented on what he implied was lack of speed on the part of BPR's engineering staff in accepting new standards for the interstate system (see p. 21).

Royal Cord Air Hose



"close order drilling" with the U. S. Army Engineers!

Near Portland, Oregon — on the mighty Columbia River — they're cutting out 1,000,000 cubic yards of tough basalt to construct The Dalles Dam. It's a $270,000,000 project. Much of the drilling is in deep, narrow cuts where highly abrasive rock and close quarters give air hose extra rough treatment. "Nothing is harder on air hose than the type of work involved on The Dalles Dam."*

What's more, deadlines and penalty clauses keep the work up to the tight schedule. So the contractors simply can't afford air hose failures. "We're using U. S. Royal Cord Air Hose. It measures up in every way to our own high-performance requirements."*

You, too, will find that U. S. Royal Cord will "measure up," because it's *the only air hose built like a tire.* True tire-cord construction means Royal Cord is so tough it needs no protective cribbing — yet it's lightweight and highly flexible.

Get Royal Cord Air Hose at any of the 28 "U. S." District Sales Offices or write us at Rockefeller Center, New York 20, N. Y.

*Direct on-the-job quotations from officials of the contractors building this multi-purpose dam.

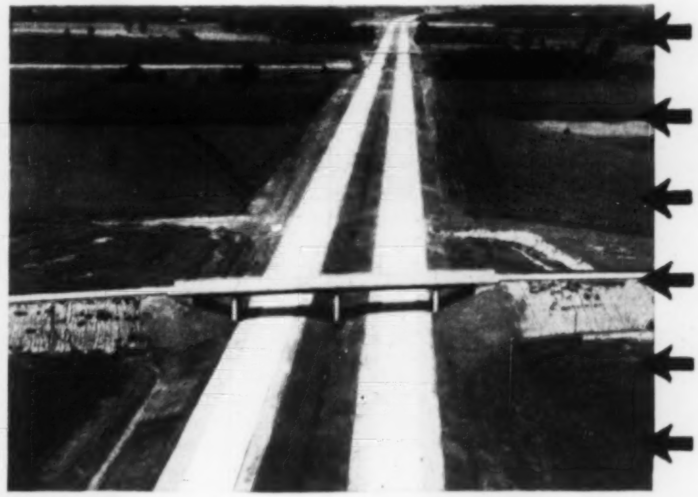
Let's look under the cover

- quality neoprene tube for maximum hot oil resistance.
- braided cotton breaker ply for permanent tube-to-carcass adhesion.
- *exclusive counter-spiraled* plies of special yarn for outstanding strength and flexibility.
- brown cover is of the strongest natural rubber ever put on a molded hose.

Mechanical Goods Division

United States Rubber

For the "Grand Plan" . . .



The Newly Approved Standards

- **Lane width 12 ft with 10-ft shoulders**
- **Design speeds minimum 50 to 70 mph**
- **Divided except where DHV will exceed 700 by 1975**
- **Median width 36 ft depending on right-of-way cost**
- **Right-of-way width 150 to 300 ft depending on type**
- **Grade 3% to 5% except in very rugged areas**

The Interstate System: It's Okay to Go

Fast action on design standards for the interstate system last week cleared the way for projects that are ready to go in the big highway program.

As approved by the Commissioner of Public Roads for the Secretary of Commerce, the new ground rules prescribe the minimums for projects on the 41,000-mi trunkline network They are no tighter and no higher than the standards sent out to the states in 1954 for use in estimating the cost of completing the 40,000-mi system as authorized at that time. The state survey led to an overall $27-billion estimate of total cost.

Like the original interstate standards developed by the American Association of State Highway Officials and adopted in 1945, the new design policy document is broad and basic. It sticks to fundamentals and leaves details of application to comprehensive AASHO manuals on design of highways and bridges.

This time, AASHO speeded adoption of the standards by bringing together the top administrative highway officers of the states in Chicago on July 12. These officials, each of them entitled to cast one vote for his state, were able to approve the standards in one day. Six weeks of balloting by mail would have been required under ordinary procedure.

Vote for the standards, section by section, was almost unanimous, except for scattered reservations on a few items. A favorable vote by 36 of the 48 states is necessary for adoption.

Five days later, Bureau of Public Roads Commissioner C. D. Curtiss informed AASHO Executive Secretary A. E. Johnson that the standards were acceptable and that he had approved them, without change, under authority delegated by the Secretary of Commerce. Their official title is "Geometric Design Standards for the National System of Interstate and Defense Highways."

In a sense, acceptance by the federal government was a formality. The standards had been worked out by the state highway officials in cooperation with BPR, as required by law.

AASHO started the job several years ago, when the accelerated construction program was only a dream. Highway officials in the various states have known all along what changes were being proposed. Top people from 20 states make up the AASHO Committee on Planning and Design Policies, the group that nursed the new standards through the long development process.

Final AASHO action was deferred until Congress settled all doubts about the new interstate program. The states knew in 1954 just about what the standards would be if the legislation went through, but they could hardly vote for higher and more costly requirements until they were sure the money would be forthcoming.

As legislation neared enactment last month, the AASHO design policy committee met in Kansas City to put the finishing touches on its report for AASHO consideration. With few changes, the recommended standards were adopted two weeks later, first by the executive committee and then by the full governing body—the association's Committee on Administration.

• They Are Flexible

Limited to essentials, the standards give only the objectives and guideline minimums of design for the interstate system. Problems of applying the design principles are left to the states and the Bureau of Public Roads to solve.

Such problems arise at once over the basic requirement for control of access on interstate highways. All the states agree that complete control of planned access is essential to a through highway if its usefulness is to be preserved. But a number of them have wanted interstate construction to include frontage roads also along the

. . . The interstate standards

outer limits of the right-of-way, to serve adjacent property.

In some locations, such frontage facilities will be needed to intercept local roads and accommodate local traffic. The standards erect no bars against frontage roads. They say that access shall be controlled by outright purchase of access rights in advance of construction or by building frontage roads, or both.

BPR has to apply the standards uniformly in all the states. The law requires that. But the bureau must have better guidelines before it can make anything like uniform determinations regarding the qualification for frontage roads on specific interstate projects.

So BPR will have to write a supplemental policy of its own on frontage roads. It's hard to see how a federal agency could do otherwise than rule that payment of federal funds for frontage roads will be justifiable only where existing conditions make such roads mandatory or where the roads will save money by reducing the construction cost of a project.

Similar supplemental guides will be necessary for other parts of the standards. But working up the auxiliary rules won't delay action on projects already well along in design. Bureau of Public Roads people and state highway engineers working on these projects have known for a long time just about what is required for approval of each.

• Traffic Basis a Problem

Another tough problem is going to be the traffic basis for design. The standards set as a minimum the usual 30th highest hourly volume, but this volume has to be estimated for the year 1975, with attracted, generated and development traffic included, on the basis that the entire system is completed. It takes experience, skill and judgment to come up in 1956 or '57 with an estimate for an interstate route or project that will stand up reasonably well until 1975.

Interstate routes are to be built at once as divided highways, the standards specify, except where the traffic expected in 1975 is low. The top traffic limit for construction of a single two-lane road is a design hourly volume (1975) of 700, where sight distances and passing opportunities are adequate. Further, a two-lane roadway must be located on full-width right-of-way in order to permit later construction of a second roadway for a divided highway.

In keeping with through highway design, the standards require grade separation for all intersections, both rail and highway, with one exception. In sparsely settled rural areas, mainly the wide open spaces of the West, where a two-lane interstate route will have more than enough capacity to carry 1975 design traffic, side roads now averaging less than 50 vehicles a day may connect with or cross the through highway at grade. State authorities, however, must retain the right to eliminate such junctions or intersections at any time.

Minimum design speeds stipulated are 70, 60 and 50 mph for flat, rolling and mountainous country. Corresponding maximum grades are 3, 4 and 5%, but may be 2% steeper in really rugged terrain.

Traffic lanes must be at least 12 ft wide, and usable shoulders to the right of traffic at least 10 ft. Shoulder width, however, may be reduced to a minimum of 6 ft in mountain locations where construction costs for extra width run high.

Minimum widths for right-of-way are not fixed by the standards. The criteria recognize that conditions make variable widths necessary. However, the document gives minimum widths to be used as guides for rural right-of-way.

Rural Right-of-Way

Type of Highway	*Minimum Width in Feet* Roads Without Frontage	Roads With Frontage
2-lane	150	250
4-lane divided	150	250
6-lane divided	175	275
8-lane divided	200	300

In urban areas, where high land costs and other conditions are likely to force a reduction in width, the standards specify that the right-of-way shall embrace all necessary elements of the interstate highway, including interchange ramps and frontage roads.

Median areas separating the roadways of divided highways shall be at least 36 ft wide, the standards say, on rural sections in flat and rolling country. For urban and mountain construction, the minimum width of median is 16 ft, except that narrower medians may be permitted in high-cost urban areas, on long bridges and in rugged terrain. No median, however, may be less than 4 ft wide.

Full roadway width, including shoulders, must be provided on all bridges up to 150 ft long, the standards insist. On longer bridges, if barrier curbs are used along the median, they must be offset at least 2 ft, while offsets to parapets or railings are to be no less than 3½ ft.

Structures crossing the highway shall have a clear height of at least 14 ft

Priest Rapids Goes Under Contract

The calm of the above core drilling scene at Priest Rapids Dam site will soon give way to the grinding and roar of earthmovers now that Merritt-Chapman & Scott Corp., New York, has been formally awarded a $91,878,625 construction contract.

The contract, awarded by the Grant County PUD of Ephrata, Wash., after successful sale of a $166-million revenue bond issue (ENR June 28, p. 82), constitutes the largest amount of construction covered by a single contract and the largest ever awarded a single contractor (ENR Mar. 22, p. 21).

Construction is expected to require about four years. Miscellaneous construction and equipment contracts totaling about $8 million remain to be awarded for the Priest Rapids work, which includes an 8,412 ft concrete and earthfill dam and installed generating capacity of 630,000 kw. The same utility also holds an FPC license for construction of 570,000-kw Wanapum Dam, 18 mi upstream. A 1958 construction start is anticipated there.

over the full roadway width, shoulder included. Lateral clearances must at least equal the width of usable shoulders, and in no case may be less than 8 ft on the right and 4½ ft on the left of through-traffic lanes.

Other sections of the standards set basic minimums of the kind that have been generally accepted and used by many states for expressway design. In these states, the new standards mean little adjustment of basic requirements for this type of construction. Design engineers are well equipped to apply the interstate standards.

Two AASHO manuals for design application of the standards have been available for some time. A third highly useful and important volume, "Policy on Arterial Highways in Urban Areas," will be ready in six or eight months. Engineers now are using "Policy on Geometric Design of Rural Highways" as revised in 1954 and "Standard Specifications for Highway Bridges," Sixth Edition, 1953. All these AASHO manuals ordinarily are revised every two or three years.

Pike Toll Changes

Report suggests truck toll cut, no change in car rate

A new study and analysis of the Pennsylvania Turnpike system has come out strongly against any raise in passenger car tolls, and in favor of a reduction of truck rates.

The report—prepared by Michael Baker, Inc., Rochester, Pa.—contrasted sharply with an earlier proposal that passenger car rates be boosted 41%. The first report, however, urged a 20% cut in truck charges. Financial troubles on that part of the turnpike east and northeast of Valley Forge prompted the earlier study, completed by Coverdale and Colpitts of New York for the J. E. Griener Co., consulting engineers to the Turnpike Commission.

The toll raise proposed in the earlier report was to have gone into effect May 25, but was postponed following a political furor. Meantime, the commission transferred funds from its construction account to the 1952 indenture sinking fund to meet immediate obligations and avoid an expected financial crisis.

The Baker report based its opposition to a toll hike on the existence of about $52 million in unused and uncommitted construction funds under the 1952 indenture, and said that the revenues of the Delaware River extension are not yet clear since the bridge connecting the pike to New Jersey's turnpike wasn't in operation until May 25.

Tons of Water to Quench Fire Cause . . .

. . . Subway Washout—Fast Repairs Needed

To the considerable surprise of many New York City residents who had feared loss of a vital subway link for several weeks, contractors, and city workers last week restored service on the vital Brooklyn link of the city's subway system just five days after it was knocked out of service.

The subway line affected—one of the city's oldest and most lucrative—was a four-track section at Astor Place, in downtown Manhattan, almost directly under the now-abandoned headquarters of John Wanamaker Co. A fire of undetermined origin started in the massive old stone and cast-iron structure.

Great quantities of water poured on the fire (ENR July 19, p. 25) found their way into sub-basements and backed up through a break in a retaining wall into the gravel bed under the 12-in. unreinforced concrete slab that carried the subway track and lines of steel columns which supported the street above. A cavity up to 8 ft deep and 130 ft long by 100 ft wide was left under the slab when the water receded—and whole sections of the slab fell into the hole, destroying trackage and leaving the steel columns hanging.

Spencer, White & Prentis, called into the job on an emergency basis by the city's Transit Authority, put their own and authority crews to work on a 24-hour schedule. They cleaned out the cavity left by the water, jacked up the columns, then chuted in 300 cu yd of high-early strength concrete, burying jacks, timbers and the old slab, to get the trains running again. Total cost is estimated at $250,000.

Changes in pay, policies and procedures are the . . .

Aftermath of the Road Act

Assured of money for their highway programs, by virtue of the recently passed federal highway legislation, state highway agencies and other groups were moving fast last week to gear themselves for the impact of new work.

Two states announced major changes—upward—in their salary schedules for highway engineers as a means of beating the shortage of trained personnel; Detroit and its surrounding counties reached priority agreements on expressway construction; Ohio clarified rules of applying state aid to urban roads.

In detail, these were some of the developments:

The Virginia Department of Highways announced pay increases averaging about 10% for more than 1,000 engineers and engineering technicians—a move affecting about 20% of the department's personnel. The individual raises run up from about $300 to as much as $900 annually. Beginner groups got the biggest boost—from a scale ranging from $4,320 to $5,160 under the old scale to $4,920 to $5,880.

In Maryland, annual pay hikes running from $126 (for first year toll collectors) to $2,416 (for top engineers) went into effect as of July 11. In addition, the great majority of the employees were promised a general boost later in the year that will average about $260 per year. The state has been plagued by what officials have called an "alarming" number of unfilled posts—there were 175 such vacancies in May.

• Limit on help—Ohio municipalities were issued a warning by the Ohio Highway Construction Council, which ruled that the state will not assist cities in financing expressway programs that cost more than a billion dollars.

The 11 largest cities in the state had requested that the state provide half of local funds (5% of total costs) for construction of limited-access within-city-limits links of the proposed interstate system. The cities themselves would pay 5% with the remainder of the money to come from new federal funds. However, Clingan Jackson, chairman of the council, told city officials that they would have to find financing for the entire 10% of the cost themselves. "It is the thinking of the council (an advisory body to the governor)," he said, "that a program of helping the cities in this matter would eat up remaining highway bond funds and result in delay of crucial projects in other areas."

The announcement was a blow in particular to Columbus' hopes of getting $6 million in state funds to complete remaining portions of its $120-million expressway plans.

• Priorities set—In Detroit, state and county officials sat down with Mayor Cobo to work out a system of priorities on completion of the several expressway programs planned to ease the Motor City's traffic congestion.

Outcome of the session was agreement that the first two projects to be put into construction will be completion of the John Lodge and Edsel Ford Expressways; selection of routes for the planned Southfield, Fort-Venor and Hastings-Oakland Expressways.

Elsewhere in Michigan, the state's accelerated superhighway program was launched with State Administrative Board approval of the sale of $16 million worth of highway bonds, to finance limited-access highways between Grand Haven and Muskegon, and to link the Detroit expressway system to another expressway to start north of Rockwood.

The bonds are to be secured by a recent boost in state gasoline tax imposts.

• Other developments—In other states, these were among the developments in the rapidly-expanding highway picture:

Officials of Kentucky and Ohio announced that two planned bridges across the Ohio river—one at Covington and one at Newport (both to connect to Cincinnati)—were "definitely included" in the interstate highway system, for financing purposes.

In Seattle, an engineering study by DeLeuw, Cather & Co. that was to have settled a conflict over location of a second floating bridge across Lake Washington provoked still further controversy when groups on either side of the lake were unhappy over a suggestion that the second structure be built parallel to the first.

Aswan, Hells Canyon—Two Dams Down

Last Thursday was a fateful day for two big dams. Secretary of State Dulles informed Egypt's Ambassador, Ahmed Hussein, that the United States had withdrawn its seven-month-old offer of a $56-million grant to help Egypt finance the huge $1,300-million Aswan Dam on the Nile River. On the same day, the Senate rejected by a 51-41 vote a Democratic-sponsored bill to authorize a federally-built high dam at Hells Canyon.

• The High Dam—The State Department action apparently ends for the time being Egypt's hope for financial aid from Western nations and an early start on the grandiose Nile River scheme (ENR Feb. 9, p. 44). The proposed $56-million U. S. grant was the key to a similar $14-million British grant and a $200-million loan to Egypt by the World Bank. Britain quickly followed the U.S. lead and also withdrew from the aid offer.

Having the support of Congress, the aid offer withdrawal appears to have stemmed from two major factors: Egypt's recently increasing chumminess with the Soviet bloc and the recent cotton-arms barter deal with Czechoslovakia which angered Southern legislators and cotton producers and which caused State Department doubts that Egypt could devote adequate resources towards construction of Aswan Dam.

Subsequent to the Dulles announcement, it became apparent that Egyptian assertions that Russia had offered aid in financing Aswan were merely bluff. Soviet Foreign Minister Shepilov stated in Moscow over the weekend that his country was not considering any offer of financial aid for the dam.

• Hells Canyon—The Hells Canyon vote represents a major Administration victory for its partnership policy and allows Idaho Power Co. to continue construction of three low dams (Brownlee, Oxbow and Hells Canyon) along the middle reaches of the Sanke River, the largest tributary of the Columbia River.

The vote was along straight party lines except for the defection of eight Southern Democrats to the Administration side. As a result of the Senate vote, a similar House bill is expected to die in committee.

But Idaho Power Co. is still not entirely in the clear. Public power bodies have before the U.S. Supreme Court a request to stay the FPC license for the Hells Canyon low dams granted to Idaho Power. However, Washington observers feel that the high court will go along with the Congressional action.

Bells Are Ringing

Cable spinning begins on Mackinac Straits Bridge

Cowbells jangled a rustic accompaniment last week to the start of cable spinning operations for the world's longest suspension bridge. And they won't stop until four "spinning wheels"—on which the bells are mounted to warn workmen of the wheels' approach—have strung 41,000 mi of wire for the two main cables of the Mackinac Bridge (ENR Jan. 27, 1955, p. 35), a highway link between southern Michigan and the state's northern peninsula.

In around-the-clock operation, the wheels will shuttle back and forth across the 8,614-ft distance between anchorages and over the 552-ft-high towers until a total of 74 strands (37 per cable) are completed, each containing 348 wirees og 0.196-in. dia. Each wheel lays four wires, working on four strands (called a set-up) simultaneously. The odd strong (of the 27), placed at the center of a cable, is spun as a separate set-up.

The bridge was designed by D. B. Steinman, of New York. Merritt, Chapman & Scott of New York, built the substructures. American Bridge Div. of U. S. Steel Corp. is erecting the superstructure.

Completion is scheduled for late next year.

ASEIB Gets Application for Sanitary Engineer Certificate

The first application for a Certificate of Special Knowledge in Sanitary Engineering has been received by the American Sanitary Engineering Intersociety Board. It marks the beginning of the first certification program in any of the several engineering specialties.

According to Ernest Boyce, chairman of ASEIB's Board of Trustees, all certified sanitary engineers will be carried on a roster to be known as the American Academy of Sanitary Engineering.

Basic requirements for certification are registration as a professional engineer and eight years of sanitary engineering experience. Total fees are $35, including a fee of $25 for an examination which may be waived in cases of extensive experience.

ASEIB is sponsored by the American Public Health Association, American Society of Civil Engineers, American Society for Engineering Education, American Water Works Association and Federation of Sewage Works Associations and is located in the Engineering Societies Building in New York.

Photo courtesy of Caterpillar Tractor Co.

MECHANIZED ASSAULT on 7-million cu yd of earth clears the way for construction of a $95-million aluminum plant on a 1,500-acre site in the Ohio River Valley.

For Aluminum Plant: The Site Shapes Up

Despite a slow start last March, it looks like this year will see the end of the huge 7,000,000 cu yd earthmoving job for Olin Mathieson Chemical Corp.'s $95-million aluminum plant near Hannibal, Ohio. Making the most of 22 self-propelled and drawn scrapers, 21 crawlers—including 4 pushers equipped with torque converters—2 graders and 2 shovels, the earthwork contractor has been making up for time lost to bad weather at the beginning of the job. Snow and rain blanked out all but three working days the first month and hampered operations on the 1,500-acre Ohio River Valley site till the middle of May.

The earth-moving contract includes not only excavating and grading the site proper, but also relocating a highway. Ohio Route 7, now bisecting the site, is being re-routed to skirt the 5,000x12,000-ft area. This part of the job has been hampered by slides that have added upwards of 500,000 cu yd to the work

The new route follows the base of a soft-clay bluff, laced with veins of slick blue clay, which cause surface material to slip down into the cut area after each pass. To combat this situation and forestall future slides, the contractor is cutting a series of benches along the face of the bluff.

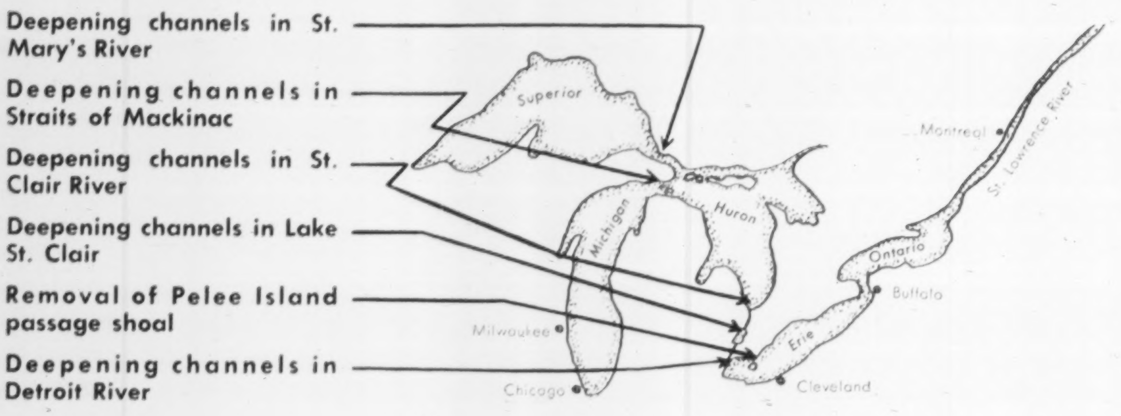
Due to the "dead" loading characteristics of the sand and gravel in the plant area, the contractor is using uphill loading to cut cycle time. When the load reaches the right size, the pusher operator signals the scraper driver by means of a red light rigged on the pusher canopy. Time and weight studies made on five scrapers revealed that working this way, each machine averages 150 cu yd bank per hour on a 1,500-ft one-way haul.

The power plant, to be built by the Ohio Power Co. in Cresap, W. Va., 15 mi from the aluminum plant, will generate 225,000 kw, half of which will be used for electrolytic refining of bauxite ore in the new aluminum plant. The entire 2-million-tons-per-yr output of the coal mine—Hanna Coal Div. of Pittsburgh Consolidation Coal Co.—will be consumed by the power plant. A 1,500-ft conveyor will move the coal from the underground slope-process mine to the generating station.

Engineer and general contractor for the aluminum plant is F. H. McGraw & Co., New York. Earthwork contractor for the plant site and road relocation is Allegheny Contracting Industries, Inc., Pittsburgh. Other contractors include Dravo Corp., Pittsburgh, installation of river docking facilities; John F. Casey Co., Pittsburgh, 600,000-cu-yd earth-moving contract for the rail spur; and Green Construction Co., Indianapolis, 800,000-cu-yd earth-moving contract for the power plant.

Legislature Ends Curb on Outside Sales of City Water

A special session of the Ohio legislature has passed a bill removing all limitations upon municipalities' sale of water to out-of-town customers. First to benefit from the action will be the Youngstown-Warren-Niles area, where it now appears assured that the General Motors Corp. will build a huge truck assembly plant. Originally, a five-mile water sale limit was in effect which would have prevented the cities of Youngstown and Warren from selling water to the plant.


Deepening channels in St. Mary's River
Deepening channels in Straits of Mackinac
Deepening channels in St. Clair River
Deepening channels in Lake St. Clair
Removal of Pelee Island passage shoal
Deepening channels in Detroit River
Superior
Michigan
Huron
Ontario
Erie
Montreal
St. Lawrence River
Buffalo
Milwaukee
Chicago
Cleveland

For Dredgers: 44,000,000 Yards to Go

Dredging contractors are prone to claim they either have enough equipment or, when the time comes, can assemble enough of it to handle almost any size job. But the Corps of Engineers will soon launch a gigantic channel-deepening project on the Great Lakes that may tax the dredging industry's capacity to the utmost. And the Corps is wondering if there'll be enough dredging and other marine equipment to insure the economic and orderly prosecution of the work, once it gets to rolling.

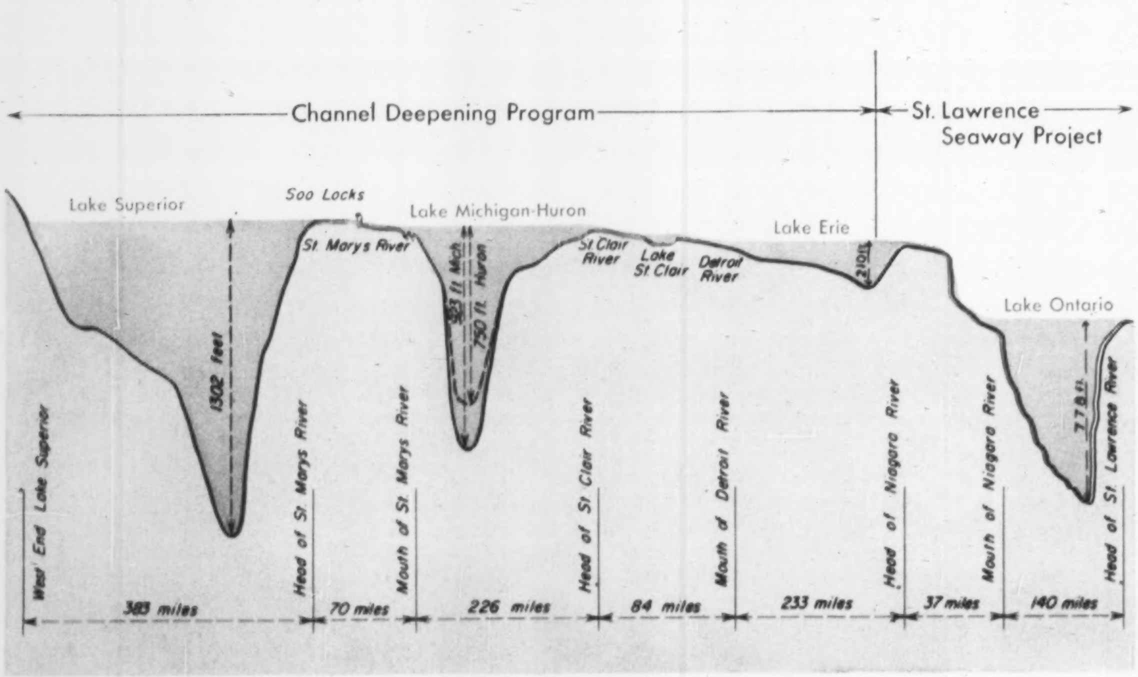
The over-all project, involving 44,000,000 cu yd of dredging at an estimated cost of $150 million, was authorized by Congress this spring (Rivers and Harbors Act of Mar. 22, 1956), and by a previous authorization in 1946. It calls for deepening the Great Lakes connecting channels from Lake Erie to the upper Lakes (Huron, Michigan and Superior).

Congress has appropriated $5 million to commence the deepening. This will permit advertising for bids the latter part of this month for dredging to begin in the Detroit River this fall, and perhaps in the St. Mary's River next spring.

The channel-deepening program is under the direct supervision of the Corps of Engineers' Detroit District, reporting to the North Central Division at Chicago. Charged with the responsibility of implementing and prosecuting the $150-million program, Brig. Gen. Paul D. Berrigan, Division Engineer, has sounded an alert to the dredging industry as to the magnitude and construction timetable of the project.

• Contractors Alerted

In a letter to 50 or more contractors noted for the size of their marine or "heavy" construction operations, Gen. Berrigan told them what the work involves, and offered to supply any additional data requested. The results were immediate and gratifying. Several firms evidenced considerable


Channel Deepening Program
St. Lawrence Seaway Project
Lake Superior
Soo Locks
Lake Michigan-Huron
Lake Erie
Lake Ontario
St. Marys River
St. Clair River
Lake St. Clair
Detroit River
1302 feet
923 ft. Mich
750 ft. Huron
210 ft.
778 ft.
West End Lake Superior
Head of St. Marys River
Mouth of St. Marys River
Head of St. Clair River
Mouth of Detroit River
Head of Niagara River
Mouth of Niagara River
Head of St. Lawrence River
383 miles
70 miles
226 miles
84 miles
233 miles
37 miles
140 miles

GREAT LAKES CONNECTING CHANNELS will be deepened to 27 ft in program.

interest, including some big ones who normally limit their operations chiefly to dry land construction.

As a major point in stimulating contractor interest, Gen. Berrigan included a tabulation (see table below) of the yardages involved, location of the major work, and estimated timetable of construction. He also pointed out that the 44,000,000 cu yd of dredging in this six-year program includes considerable dredging yet to be done in the St. Mary's and Detroit Rivers under the Rivers and Harbors Act of 1946.

The three main areas of the channel-deepening are: the St. Mary's River between Lakes Superior and Huron with the famed locks at the Soo; the St. Clair River and Lake St. Clair just above Detroit; and the Detroit River forming the lower end of the connection between Lakes Huron and Erie.

• Three Kinds of Dredging

To give the dredging industry as accurate a picture of the work as possible, the 44,000,000 cu yd of dredging have been broken down into three classifications, with estimated volumes for deepening the various channels.

As shown in the table there will be about 16,000,000 cu yd of hydraulic dredging. Responses from the dredging contractors indicate there may be enough pipeline dredges to handle this part of the work.

The major portion of the work, about 24,000,000 cu yd, will require removal by dipper or bucket dredges. The toughest material to be removed, and fortunately the smallest in volume, is 4,000,000 cu yd of ledge rock. Removal of this material will require heavy dredging equipment and perhaps a variety of methods.

Commenting on the impact of this big channel-deepening project on current dredging in the Great Lakes area, Gen. Berrigan also had this to say in his letter to the contractors:

"It is expected that the deepening of the connecting channels will be carried on at a rapid rate to provide minimum depths of 27 ft from Lake Erie to the upper lakes as soon as practicable after the 27-ft (St. Lawrence) Seaway is available from Montreal to Lake Erie. It is probable that the deep draft Seaway channel from Montreal to Lake Erie and the similar deep draft connecting channels from Lake Erie to the upper lakes will result in a large amount of dredging both public and private at many of the major ports on the Great Lakes.

"As you probably know there is now in progress a major dredging program in the St. Lawrence River in connection with the Seaway. This will continue for at least three more years. Therefore, it appears that for the next several years the volume of dredging in the Great Lakes area will far exceed any similar program in the past."

• Scope of the Work

It would be difficult to find a suitable yardstick with which to measure the magnitude of the federal government's program of deepening the connecting channels between Lakes Erie, Huron and Michigan, and Superior. The volume of material to be dredged is no measure of the magnitude of the work, since it is spread out over such a large area.

But just for comparison, the 44,000,000 cu yd of dredging in the $150 million, six-year program is 50% greater than the volume of embankment in Fort Randall Dam on the Missouri River. It is nearly two-thirds the volume of Garrison Dam embankment, and one-third the volume of hydraulic fill at Fort Peck Dam in Montana (ENR Mar. 15, 1951, p. 34).

A better evaluation of the complexities and magnitude of the channel deepening program was brought out in an informal interview with Gen. Berrigan and his chief technical assistant, Edwin W. Nelson. Here's what they told ENR.

• Is this program an integral part of the St. Lawrence Seaway project?

Although the deepening of the Great Lakes connecting channels is not primarily a part of the St. Lawrence Seaway project, basically it is vitally connected with the Seaway project.

• How are the two programs linked together?

In authorizing the St. Lawrence Seaway, Congress authorized a 27-ft

Dredging Program—Great Lakes Connecting Channels

	Approximate Quantities Cubic Yards			
Location	Ledge Rock	Dipper or Bucket Dredging	Hydraulic Dredging	Estimated Timing of Construction
St. Marys River, Michigan:				
Gros Cap Shoal to MacArthur Lock	80,000	9,660,000		1957-1962
MacArthur Lock to upper end of Neebish Channel	2,000	1,540,000	4,070,000	1957-1961
West Neebish Channel	338,000	360,000	670,000	1959-1960
Middle Neebish Channel and Lake Munuscong	780,000	1,440,000	3,130,000	1957-1958
Subtotal, St. Marys River	**1,200,000**	**13,000,000**	**7,870,000**	
St. Clair River and Lake St. Clair, Mich.:				
Foot of Lake Huron to Lake St. Clair		6,300,000		1957-1962
Lake St. Clair		1,500,000	3,130,000	1957-1961
Subtotal, St. Clair River and Lake St. Clair		**7,800,000**	**3,130,000**	
Detroit River, Mich.:				
Above Livingstone Channel		1,700,000		1958-1962
Amherstburg Channel	2,800,000	1,500,000		1957-1960
Channel passing East of Detroit River Light			5,000,000	1957-1962
Subtotal, Detroit River	**2,800,000**	**3,200,000**	**5,000,000**	
Grand Total, Connecting Channels	**4,000,000**	**24,000,000**	**16,000,000**	

channel from Montreal to Lake Erie only. The channel-deepening program picks up at that point and includes the channels connecting Lakes Erie, Huron, Michigan and Superior.

In justifying the cost of the $150-million channel-deepening program, Army Engineer studies of the present commerce and future potential lake shipping, considered domestic traffic only. Although it was recognized that the Seaway would greatly increase the amount of traffic on the Great Lakes, no Seaway commerce was evaluated in calculating the cost-benefits ratio of the channel-deepening program.

• Will this channel-deepening program compete very strongly with the St. Lawrence Seaway for dredging capacity or equipment?

It most certainly will. The people on the upper Great Lakes are just as anxious to get their dredging done as are those on the Seaway or on the lower lakes. It will also have to compete with a number of other big projects all over the country which have scheduled large volumes of dredging during the next three or four years.

• Will speed of construction be an important factor?

It will not. There will be no premium set on speed in deepening these channels. Instead, contracts will be awarded and the work prosecuted at the most economical rate feasible. Congressional appropriations will also have a bearing on construction schedules.

In reality, the project is being programmed for construction at a reasonable speed, which will probably call for completion in 1962. To try to complete it coincident with completion of the Seaway in 1959 would put too much premium on time and would cost too much.

• Will the work require dredging equipment of unusual size or capacity?

Not necessarily, since the maximum depth of water will be only about 30 ft. Some contractors are talking of adapting land-operated excavating equipment for the work, by mounting long-boom shovels with dippers, clamshells or draglines, on barges.

One big advantage of this type of operation is that the equipment could be reconverted to land usage at the end of a contract, or during a wintertime shutdown, without too much expense, compared with the expense of handling hydraulic dredges.

• What size dredge will probably be the most economical?

Medium size dredges will be used mostly, since our project design channel depth ranges from 27 to 30 ft. Maneuverability will be a factor since there will be considerable amount of rather shallow deepening of channels over a large area.

• How much will the connecting channels be deepened, on an average?

That's a difficult question since there is no constant channel depth for the dredging.

It depends on whether the channel in question carries upbound or downbound traffic; whether it's in a protected area where waves won't be excessive, or out in the open where winds and waves are important factors; also the speed at which boats will be traveling.

In general, upbound channels will be deepened about 6 ft; downbound and two-way from 2 to 4 ft.

• What will be the general procedure in deepening the channels?

In the first place, the dredging in the various channels will have to be carefully coordinated since it is necessary that they be kept open to traffic at all times.

In channels carrying both upbound and downbound traffic, construction plans call for deepening one of the channels to its required depth, followed by dredging the other. Chances are that the wider two-way channels will be deepened first, then the single-directional channels.

• At what point in the program will lake shipping begin to reap benefits from the deeper channels?

Dollarwise, probably when the program is about half-finished. Actually, some benefits will begin when the channels are deepened to a usable depth of 25 ft.

In general, the downbound channels are now 25 ft and the upbound channels about 21 ft. In the first construction phase these upbound channels will be deepened to a 25.5-ft safe draft. This will permit greater boat capacities which mean additional dividends for the users. In the final stage the one-way downbound channels will be closed to traffic and deepened to provide the project safe draft of 25.5 ft.

• What work will get under way first?

Present plans are to take bids first on dredging the Amherstburg Channel at the lower end of the Detroit River. The Army Engineers were authorized to deepen this channel several years ago.

This will be one of the larger jobs in the program. It will involve the removal of about 2,800,000 cu yd of ledge rock and 1,500,000 cu yd by dipper or bucket dredge, at an estimated cost of about $40 million.

• What size contracts will be awarded?

Some will be of such size as to interest the medium-size contractors, while some of the dredging no doubt will be performed by smaller outfits, as subcontractors.

Some of the dredging contracts, especially those in the larger class will be let as "continuing contracts," contingent upon future Congressional appropriations being made at the proper time and in sufficient amounts.

• How much interest are the dredging contractors showing in this $150-million channel-deepening program?

Judging by the inquiries received to date, contractor interest is encouraging and indications are that it will increase sharply as the 44,000,000-cu yd dredging project gets under way.

As would be expected, the larger contractors are showing the greatest interest. As to contractor capacity, one old-line firm says it would easily handle $35 million worth of dredging annually in addition to its present commitments.

Fence or Wall?

Prison plans bog down as planners tangle on costs

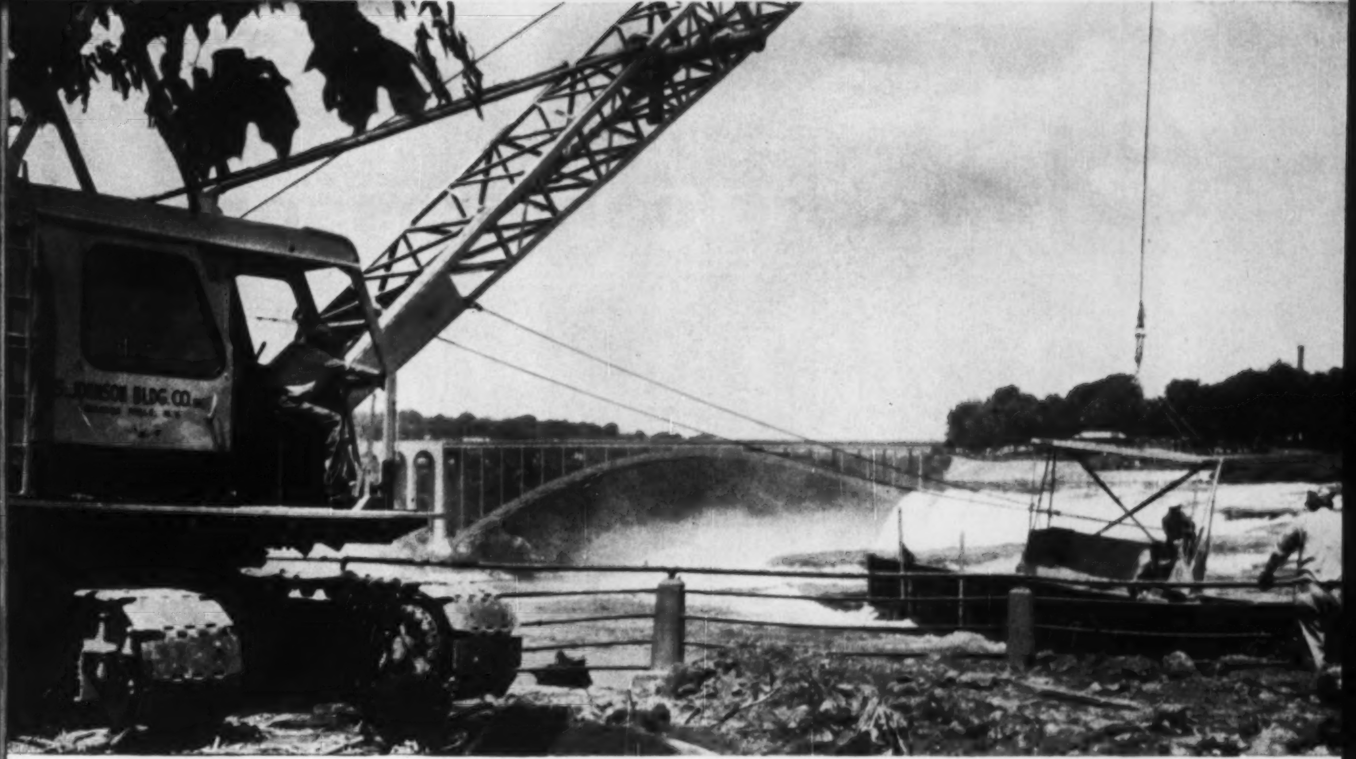
Plans for a $16- to $20-million state prison at Enfield, Conn., have bogged down in a disagreement over the type of enclosure. The State Building Program Commission favors a wall, but some religious and taxpayer groups object on the grounds that a fence would be cheaper and more humane.

Estimated cost of a mile-long 25-ft high wall dug 5 ft underground is close to $1 million. Two fences, 12 and 15 ft high, separated by a dry moat, reportedly would cost $400,000.

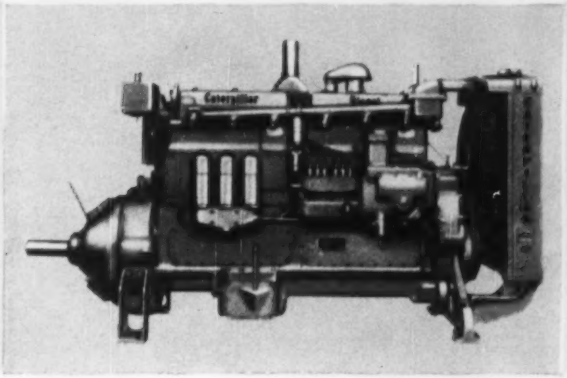
Wall advocates say that a wall would last 100 years while fences would have to be replaced. Opponents of the wall counter with the claim that penal experts, including the U. S. Bureau of Prisons, recommend fences as being perhaps more secure. The objectors report also that prison authorities say maintenance would cost more for a wall than it would for fences.

The 1955 legislature authorized a $3-million bond issue to raise money for site development and for construction of a warehouse, administration building, hospital, utility structures and the first 11 cell blocks.

The new penitentiary, planned for completion in 1962, will house a maximum of 1,200 inmates. It will replace the existing prison at Wethersfield, Conn., built in 1827 and now overpopulated by nearly 900 prisoners.



DEPENDABLE CATERPILLAR POWER HELPS CHANGE NIAGARA'S COURSE



Caterpillar-powered equipment is helping slow Niagara's famous Bridal Veil Falls to a temporary trickle. This CAT*-powered Koehring crane is swinging two men with sandbags to build a diversion dam in the Niagara River. Walter S. Johnson Building Co., Inc., of Niagara Falls, N. Y., is building a total of three dams. The objective is to direct the river flow away from two islands, which are badly water-eroded, so that overhanging precipices can be cut away.

"We've been in business 33 years," says Jack B. Johnson, vice president, "and when we discovered Cat quality, we stayed Caterpillar owners. They're dependable, durable machines." The Johnson company is 100% Caterpillar equipped. They have a D315 in another Koehring plus four Caterpillar track-type Tractors, in addition to the D13000 in this rig.

The D13000's reputation as a tough, long-wearing engine is now being carried on by its new modern version, the D342, which develops even more horsepower from the same size engine. The D342 is only one of the new models in the Caterpillar line of modern Diesel Engines, now available with maximum output capacities up to 650 HP.

All these new power plants share the advantages of Caterpillar's sturdy four-cycle construction. There's no need to clean air boxes or cylinder ports, or to tinker with fuel injection adjustments. These dependable yellow engines have such long-life features as "Hi-Electro" hardened crankshafts, special aluminum alloy bearings, and highly effective oil, air and fuel filters.

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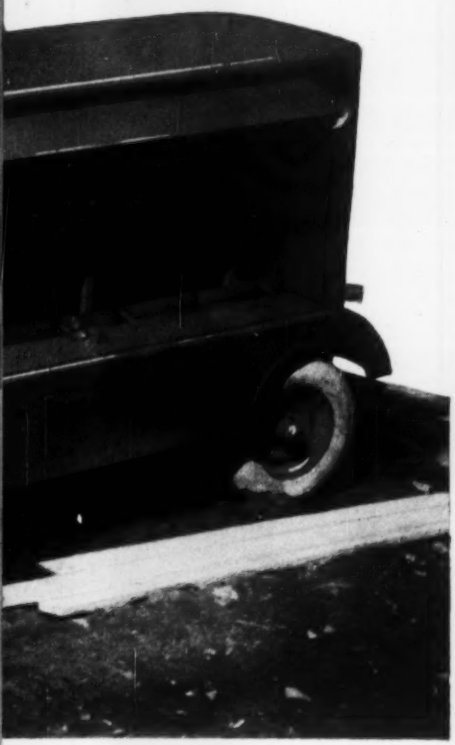
A gang of 600 cu. ft. "Power Vane" CP Rotaries supplies air for drilling operations on a section of the New England Thruway.



This 900 cu. ft. CP Rotary supplies air at 100 lbs. for smooth, efficient operation of the Vulcan 50C differential pile hammer driving 180 ft. piles.

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Earthquakes:

This destructive force of nature will be with man always. What must be done to prevent it from creating scenes such as this Greek town? Facts about and plans for protection against earthquakes were discussed at a recent world-wide earthquake and engineering conference where . . .

Quake-Resistant Design Experts Pool Knowledge

What is the status of man's knowledge of earthquake-resistant design? That was the basic question considered at a five-day, mid-June conference at Berkeley, Calif., attended by almost 400 experts from all over the world.

The answer has many facets, and while it was very obvious that much more information is needed, progress is nevertheless being made through extensive research, and designers are satisfied that well-planned structures are adequate to resist earthquakes.

As would be expected, conditions of knowledge vary all over the world. Japan is probably giving more concentrated attention to the problem than any other country because it is earthquake prone. U. S. knowledge is well developed, but U. S. applica-

Otsuki *Japan*
Mere stress calculation is not enough

Pinar *Turkey*
Turkish architects design strong buildings

Ramirez *Colombia*
Strong homes for peasant population

tion is limited since only a small area of the country has an earthquake history. South American countries are developing good earthquake design practices, but applicating progress is notably slow. In Italy, Japan and New Zealand, progress is made by model analysis, full-scale tests and electronic computers.

The world conference on earthquake engineering was originated and planned by the Earthquake Engineering Research Institute under direction of its president, Prof. George W. Housner, California Institute of Technology. General chairman was John E. Rinne, civil and structural engineer, Standard Oil Co. of California. The conference was presented jointly by the institute and the University of California with the cooperation of the Structural Division of the American Society of Civil Engineers and the Structural Engineers Association of California. Its stated purpose was to bring together "scientists and engineers from major seismic areas of the world in order that their knowledge of earthquake-resistant design and construction may be pooled for the benefit of all mankind." It apparently succeeded in that. Its more than 40 technical papers will be published and will be available for $8.50 from Karl V. Steinbrugge, secretary, Earthquake Engineering Research Institute, Merchants Exchange Building, Room 1039, 465 California St., San Francisco 4, Calif.

Here are some of the thoughts expressed at the meetings:

J. Otsuki—Japan

Seismic coefficients for earthquake design were developed in Japan as long as 40 years ago. But it was not until the 1923 earthquake that lateral force design provisions were included in the Japanese building code. During World War II, necessity for conserving materials resulted in doubling the allowable stress for seismic conditions. Even though structures in Japan are built in compliance with the building code, we really don't know if they are earthquake resistant or not. In the final analysis the magnitude of the coefficient and distribution of the forces are matters of engineering judgment. Buildings should be proportioned with good engineering judgment and shouldn't be given a mere stress calculation.

Dr. Nuriye Pinar—Turkey

In Turkey, one of the most active seismic areas in the world, some 50,000 people have been killed by earthquakes since 1938. Nevertheless, design techniques have not generally advanced to the scientific application of earthquake design principles. One of the more remarkable facts in Turkey is that mosques of Byzantine architecture that have been in place for literally hundreds of years have stood numerous temblors. Perhaps this is because the central cupolas have been buttressed and supported by surrounding cupolas, making a strong structure.

J. E. Ramirez, S. J.—Colombia

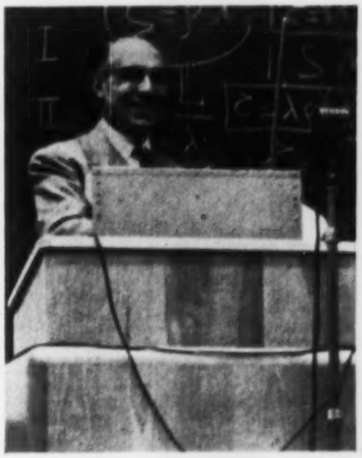
Colombia has a great national seismological laboratory. But design of major structures is still left unregulated. Major concern in Colombia at present is providing homes for peasants that are both resistant to earthquakes and healthier to live in. In this home-building program, an earthquake factor of 0.05 g has been used.

Vernon A. Murphy—New Zealand

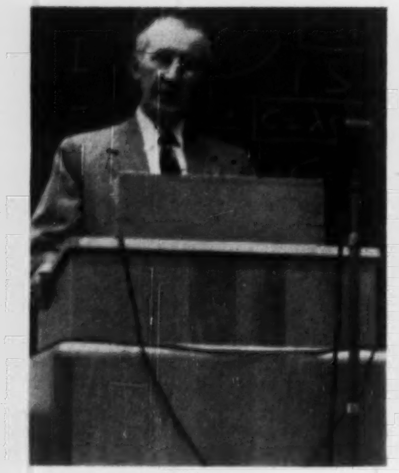
Stimulated by advances in other countries, New Zealand has had standard building bylaws since 1933 that include earthquake design factors. New Zealand has had considerable earthquake experience being in an active seismic zone. Wellington is subject to quakes but strangely enough Auckland—New Zealand's biggest city—is not considered to be

Murphy *New Zealand*
Stress analysis by electronics

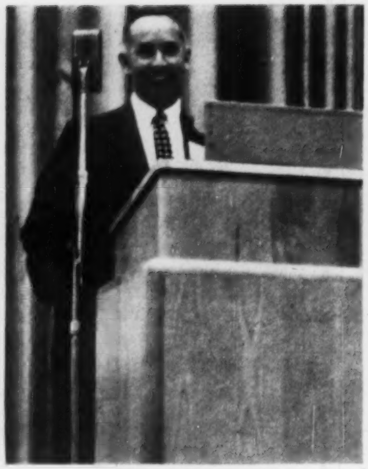
Rosenblueth *Mexico*
Seismic design progress is slow



Oberti *Italy*
Model analysis for 130-m skyscraper



Brunnier *U.S.*
Only 2% of U.S. lies in earthquake zone



Moore *U.S.*
Sandy soil is sensitive to shock loads

Amano *Japan*
Quay walls should be designed for temblers

earthquake prone. Result is that there is some consideration of relaxing earthquake design provisions at Auckland. New Zealand has an electronic computor that is specially designed to analyze stresses in buildings. This makes earthquake-resistant design work easier.

Abdul Khan—Pakistan

When Pakistan was established as a country there were no seismological facilities. Through the help of UNESCO a seismological observatory was started in 1951 that by 1954 was in full operation. In the Baluchistan area, the Quetta (pop. 75,000) earthquake of 1935 killed 20,000 and destroyed the city. Buildings in Quetta were rebuilt following earthquake-resistant design techniques. The design factor used was 0.125 g, but no tall buildings were built. A severe quake on Feb. 18, 1955, tested the designs. All aseismic designs stood up well. Some nonreinforced compound walls came down. Balconies pulled out which were not properly bonded to main buildings. Little damage was done to reinforced concrete buildings except where there were unnecessary additions and decorations. But in all of Pakistan only Quetta has an earthquake design code.

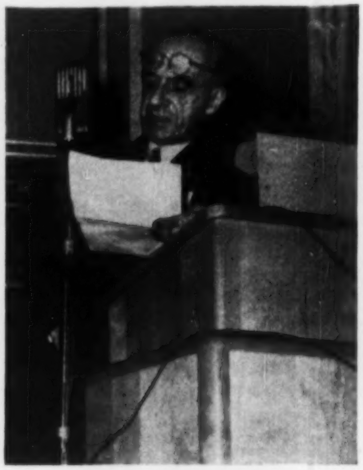
Emilio Rosenblueth—Mexico

Progress of seismic design in Mexico is slow. Only the Federal District of Mexico (Mexico City) has a building code. This code prescribes seismic coefficients that vary from 0 to 0.1 g depending on the type of building. For ordinary office and apartment buildings the factor is 0.025 g. The Mexico City code permits a 33% increase in allowable stress for earthquake and wind forces, but seismic stresses are computed on the full live load. One of the weaknesses in the code is that there is no provision for earthquake-resistant foundations. Also the code does not necessarily reflect actual design practice. Deviations are permitted if subject to a rational analysis. Most designers in Mexico City are aware of the problems involved and most tall buildings are subjected to a dynamic analysis.

Guido Oberti—Italy

Since the 1908 Messina earthquake, Italy has recognized the dynamic properties of buildings. And Italy is divided into two earthquake zones for design purposes. A private cor-

Raphael *U.S.*
No known dam failure due to earthquake



Semenza *Italy*
Avoid overdesign of dams

Newmark *U.S.*
43-story Mexico City building on poor soil

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Here's what Roy Worthington, Hermitage, Missouri, says about his HD-6 with hydraulic bulldozer and rear-mounted ripper:

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"Smooth-running, constant power." This is what Roy Worthington said about the 55-belt-hp Allis-Chalmers diesel engine. It delivers power for big output and has ample reserve. Stripping topsoil or digging ponds, the HD-6 is powered for more production, lower job costs, longer life.

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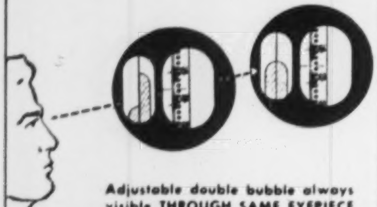

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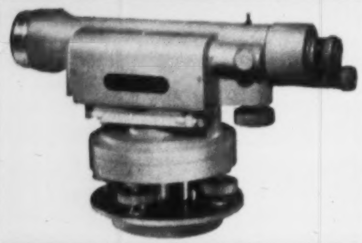

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poration has undertaken research in this field—ISMES (Institute for Experimental Models and Structures). The private setup permits financial support and freedom of movement. Model design is gaining impetus. A model on a 1/15th scale of a 130 m skyscraper for Milan was built on a 10-15-ft platform and subjected to vibrations. Italy has also designed dams by use of model analysis.

Henry J. Brunnier—U. S.

Only 2% of the total U. S. land area lies within the known world belt of earthquakes. Most of this is on the West Coast, but earthquakes have occurred elsewhere, notably in Boston in 1755 and in Charleston in 1886. West Coast earthquakes (San Francisco in 1865, 1868 and 1906, Santa Barbara in 1925, Long-Beach in 1933 and Tehachapi and Bakersfield in 1952) have caused the Pacific Coast area to assume leadership in seismic design and construction. San Francisco's building code has gone through several changes. For years only an equivalent wind load was required and then only for buildings more than 100 ft high. The Riley Act pertaining to public buildings, passed after the Long Beach earthquake, was the first law in the U. S. referring to earthquake-resistant design provisions as a percent of gravity. Only recently has the San Francisco building code adopted dynamic design provisions which were developed by a joint committee of the San Francisco Section, American Society of Civil Engineers and the Structural Engineers Assn. of Northern California. Even with explicit code provisions, the most important phase of earthquake-resistant design is to build of good materials and to tie together all elements.

W. W. Moore—U. S.

Sands are sensitive to shock loads. Clays react more slowly. Most natural soils lie somewhere between these two extremes. Earthquake loads are short-time loads, and it may be appropriate to increase allowable foundation loading for earthquake stresses. For clays this increase might be as much as 100%. But earthquake loads shouldn't be neglected. In particular, eccentric loads should be watched. Tall stacks that rock under wind and earthquake loads may eventually exhibit failure at the foundation edge. Edge pressures for eccentric loads, thus, should be limited to a percentage of concentric loading. Sandy soils might be limited to a 75% edge pressure, for example. Pile foundations are vulnerable to settlements that might be introduced by earthquakes. Batter piles, for example, might be subjected to bending stresses.

R. Amano—Japan

Japanese experience has included quay wall failure due to earthquakes. This is mostly from lateral earth pressure due to the difference between elevation of the sea bottom and the earth behind the walls. Designs to overcome such failure include piles—some on a batter—extending through the natural slip plane of the earth mass behind the quay wall. Sometimes natural material is replaced with some coarse aggregate to help resist slippage. And structures are designed to be resistant to settlement.

J. M. Raphael—U. S.

Earthquake design of dams is a serious problem because they are usually built in little populated areas where earthquake history has not been recorded. For instance, there was no knowledge of seismicity in the area around Hoover Dam when it was designed. Interaction of the dam and reservoir should be considered. Gravity dams, because of mass, are more susceptible to quake damage than are arch dams. But there are no known cases of dam failure due to earthquakes.

Carlo Semenza—Italy

Italy is obliged to build dams in seismic areas. Many arch dams in Italy have successfully resisted earthquakes. Model analysis helps keep weight of dams down—an important factor in earthquake resistance. And the weight savings save cost. Only 4,000 cu yd of concrete need be shaved off a dam mass to pay for a model analysis.

N. M. Newmark—U. S.

A 43-story building is under construction in Mexico City designed for earthquake resistance and situated on settling soil. The structure is protected from settling by mounting it on piles penetrating through the settling strata. And weight of the building is restricted to the weight of the soil excavated for the four basements. The Mexico City code includes a 0.025 g seismic coefficient. But that is not considered adequate. So the building was subjected to a dynamic analysis. Resulting shears vary. Base of a tall television tower is designed for 0.19 g; the 41st floor for 0.14 g; the 39th for 0.105 g; the 35th for 0.07 g and the 27th floor and below for 0.04 g. Deflections are reduced by making the 3½-in. reinforced concrete floor act integrally with the steel girders by use of closely spaced shear connectors. Diagonal reinforcement in the floors makes them act as diaphragms to transfer shear. The building has no shear walls; all lateral force is taken in the steel frame. Result is moment connections heavier than in the Empire State Building.

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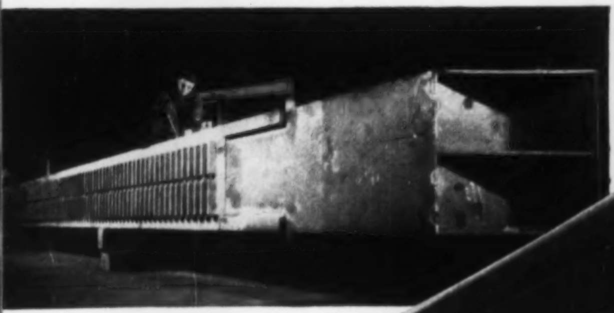

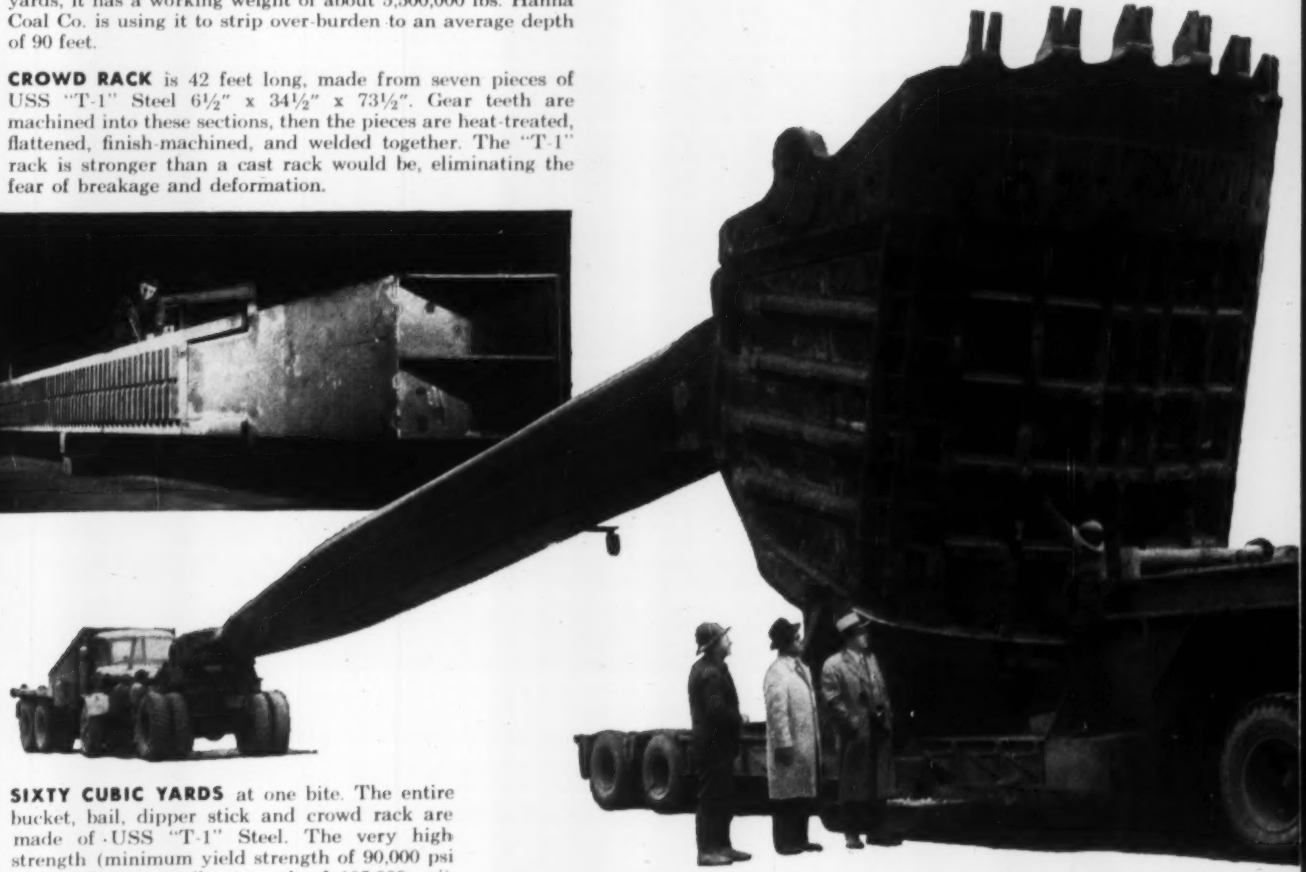

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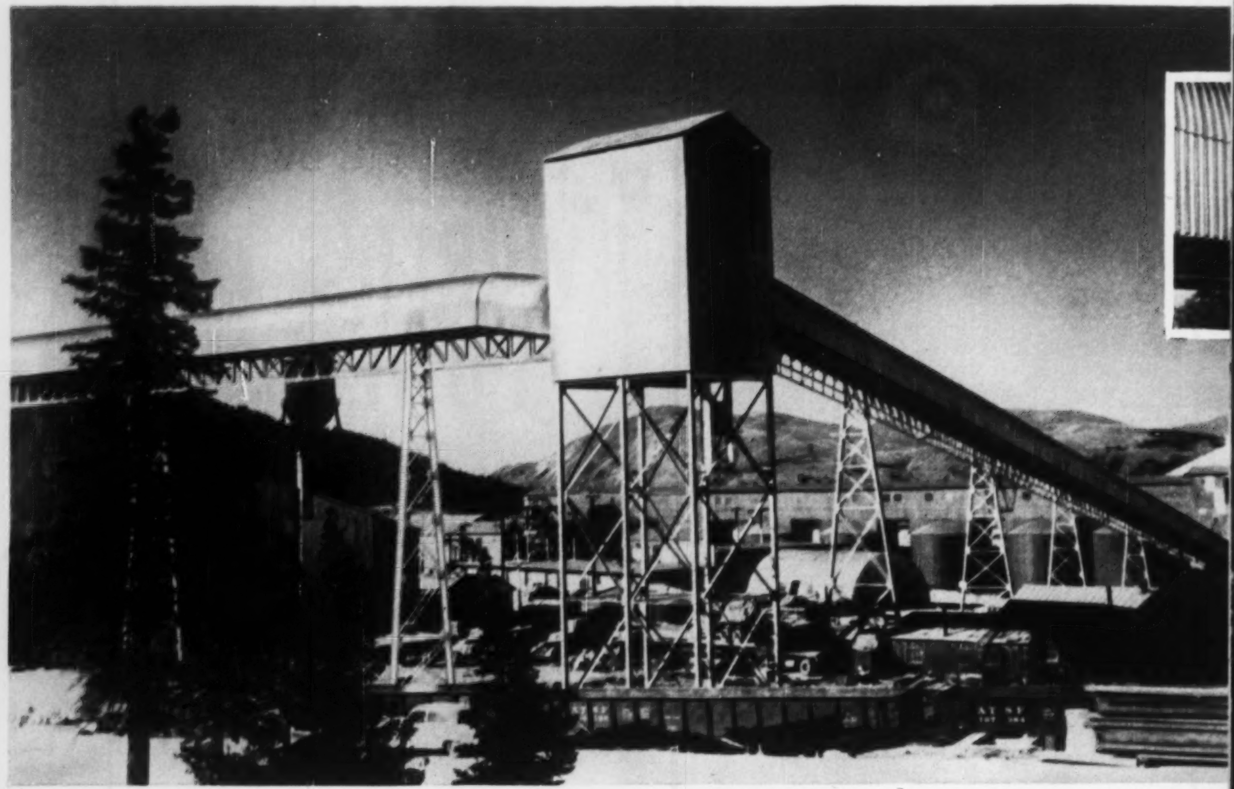

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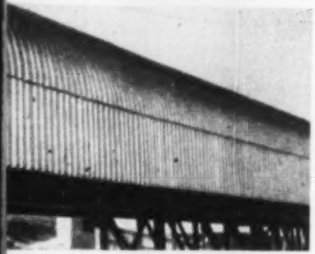

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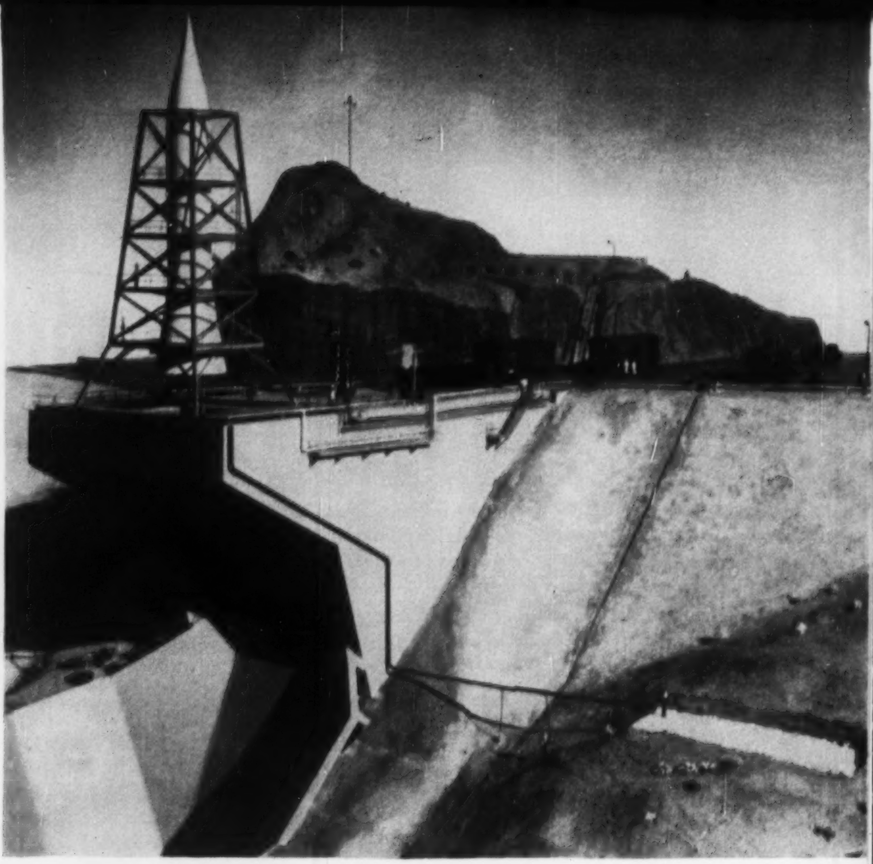
Model of the rocket test stand for Edwards Air Force Base highlights features that create a formwork problem: A 52-ft concrete cantilever strong enough to take a million pound thrust and heavy enough to eliminate resonant vibration, and a 150 ft clearance between the platform and the bottom of the flame-deflection pit.



Rocket Test Cantilever Concreting Needs Massive Timber Tower

A huge concrete structure is nearing completion on California's Mojave Desert which will provide an important new facility for the Air Force's rocket testing program.

Major construction feature is casting a concrete overhang that extends 52 ft from the remainder of the structure. Thickness of the arm is 40 ft at the haunch and 15 ft at the outer end. The huge cantilever is supported during concreting by a 100-ft high timber tower designed for earthquake resistance.

The new facility will be capable of testing rocket engines having as much as 1,000,000 lb of thrust. Although other test facilities are capable of resisting as much thrust, this installation incorporates two new design concepts. Being constructed entirely of massive concrete, it will not be as susceptible to resonant vibration as are other installations. And, a much greater distance is provided between the test platform and the flame deflection pit. This 150 ft of clear space will make possible static testing of rocket engine stage jettisoning without resorting to flight tests at an early development cycle.

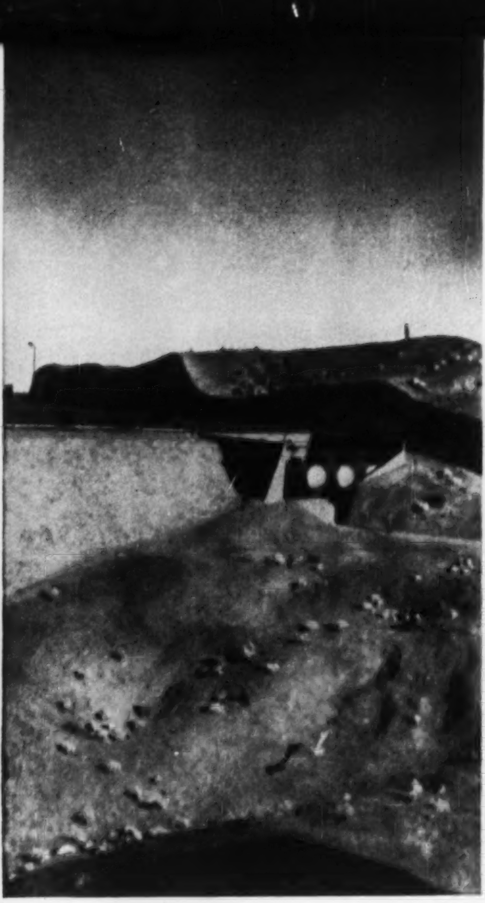
The installation is located at the Experimental Rocket Engine Test Station, which is part of the Air Research and Development Command's Flight Test Center at Edwards Air Force Base. Criteria for the facility and its instrumentation was established by Frank DeBaets and Thomas Watson of the Rocket Engine Test Station. The installation was designed by the Ralph M. Parsons Co. of Los Angeles. It is being constructed by the George A. Fuller Co. of New York and Los Angeles under the supervision of the Los Angeles District, Corps of Engineers, U. S. Army.

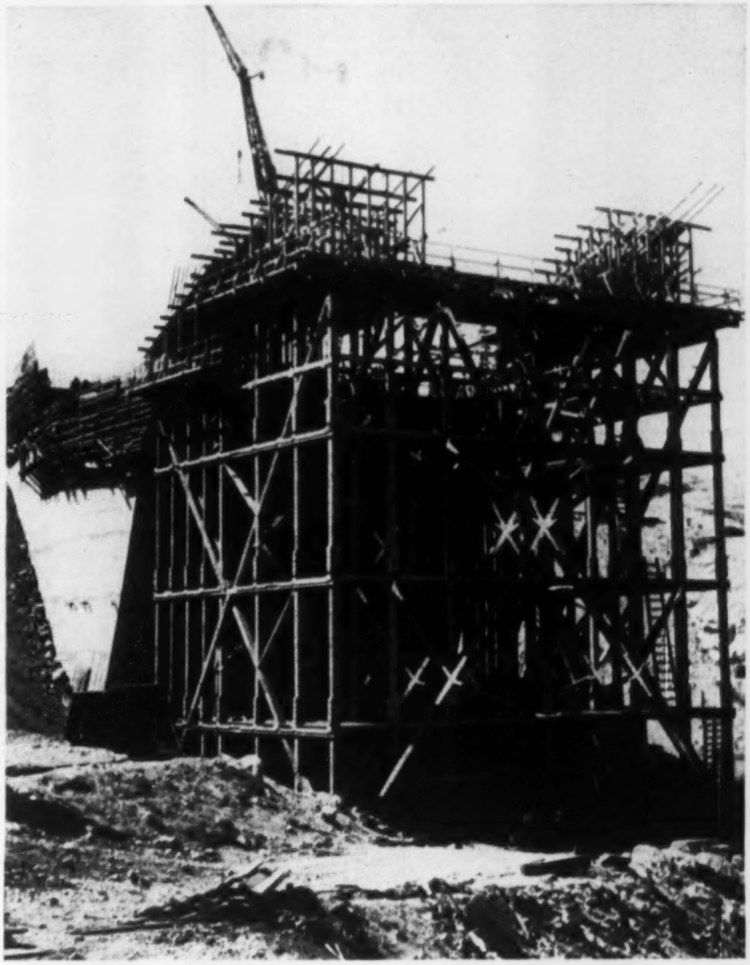
• **Concrete structure is huge**—The cantilever overhang is only a small portion of the huge concrete structure provided to counterbalance forces on the cantilever and carry the loading to bedrock. Total length of the test-stand proper is 203 ft. But this is not all mass concrete. The part of the facility that is dug into the hillside is made up of extremely thick longitudinal and transverse walls dividing the installation into chambers. The top level chambers are used for the testing program. Lower levels are left empty, and still other chambers are backfilled to provide ballast.

This particular site was selected for the test stand location because good rock foundation was available for the heavy concrete structure. Another important reason for site selection is this steep hillside location permits the great distance between test stand deck and flame deflection pit.

The structure is founded on heavy concrete footings reaching deep into the rock. One footing is located at the rear edge. The other is dug deeper into the rock and is about the middle of the facility. This footing is 10 ft thick and measures 30 ft wide by 120 ft long. Height between the footing and the deck is 146 ft.

In excavating for footings, excellent granite and granodiorite rock was reached at the expected elevation. But





TIMBER FALSEWORK TOWER, 100 ft high, supports concrete forms for rocket test stand cantilever. Made mostly of 12x12's, it contains 150,000 fbm of timbers. Cantilever extends out 52 ft, is 70 ft wide and 40 ft thick at haunch, 15 ft at tip.

Support

rock above this proved to be faulted and broken. Th design called for this upper rock formation to provide some support for the lower walls. So it was decided to remove the poor formation and replace it with grouted rock. However, it proved cheaper to replace this material with lean concrete having some 1,000 psi strength. Reason is that all aggregate for the work had to be hauled a substantial distance. Locally available rock is of poor quality and not enough concrete is required to warrant setting up a quarry and crushing operation. Thus it was just as easy to place lean concrete as it would have been to develop and grout bigger rock of good quality.

• Design problems—Major problem in structural design was carrying the loads from the cantilever down into the rock. And the loadings were of two distinct types. Under dead-load conditions the top of the cantilever is in tension. But under test loads the rocket engines are expected to exert an upward thrust on the cantilever of as much as 1,000,000 lb, which would put the bottom edge of the cantilever arm in tension. Actually, dead load with a 15% seismic factor governed much of the design. This resulted in 130 #11 bars in one cluster near the upper surface. And a similar grouping of fewer bars is located at the bottom cantilever face. All reinforcing steel is butt welded.

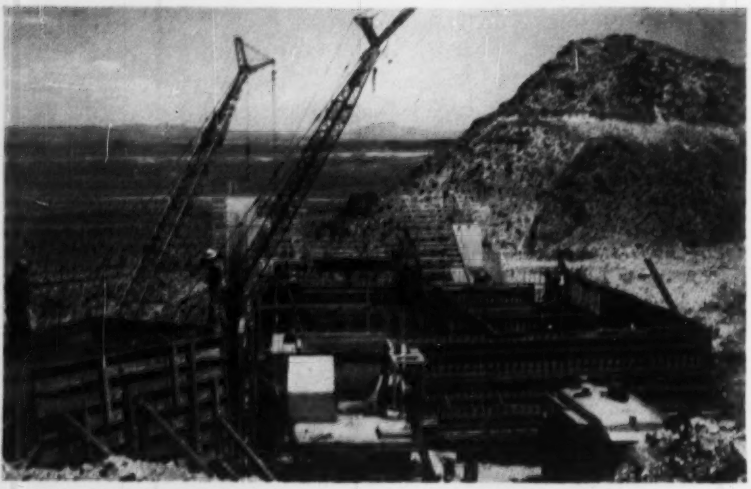
Except for the cantilever arm, the concrete work is fairly routine. The walls are as much as 8 or 10 ft thick at the bottom and a minimum of 2 ft thick. Problem in concreting was to develop production to meet schedules. Result was a two-shift operation. All formwork was accomplished on day shift. Then at night the concrete was placed in the forms. This usually resulted in continuous pours of from 250 to 350 cu yd average. Maximum pour was 750 cu yd in a day.

Almost all the concrete was pumped into place—a small portion was handled by crane and bucket. The pumped concrete was 2-in. slump with 2-in. maximum aggregate and from 5¼ to 6 bags of cement a cubic yard. No admixtures were required to facilitate pumping. Pumping had no negative effect on concrete strength. In fact, the Corps of Engineers inspectors found that samples taken at the end of the pump line were actually stronger than samples taken from concrete dumped into the Pumpcrete machine. This might be due to the additional mixing effect of the pumping action.

The structure includes more than 3ff tons of reinforcing steel and some 26,000 cu yd of concrete. Concrete is provided by a ready mix firm which set up a batch plant for the purpose at the isolated location.

• Timber falsework tower—Most difficult concreting problem faced by

. . . Building the timber tower



FORMWORK IS CONSTRUCTED on day shift. Concreting is an evening- and night-shift operation, with most of the mix pumped into the forms. Two-shift operation aims at early completion to make facility available as soon as possible for test work.

Carbro Construction Co., subcontractor for concrete work, was casting of the concrete cantilever. This was a vital element from the standpoint of the work schedule too. The cantilever could not be cast until most of the remainder of the structure was in place. And work on the flame deflection pit could not start until the cantilever had been completed and its shoring removed.

First problem in the cantilever casting was to provide support. After investigating several schemes, Carbro Construction settled on use of a heavy timber tower. The tower was subcontracted to Timber Structures Inc. of California. It was required to take a 7,500-kip load and be able to resist earthquake stresses should a temblor occur during the concreting. Timber Structures in turn called on the engineering firm of John J. Gould and H. J. Degenkolb of San Francisco to design the structure.

The tower is made up largely of 12x12-in. timbers with design capacity in compression of each such member figured at 180 kips. End grain crushing governs strength in compression. And by using steel shim plates for end bearing, the designers were able to increase normal strength by one-third. The rest of the vertical splice detail resists only nominal loading with tension under consideration only for possible unbalanced load.

The main part of the timber tower is 80 ft high with additional form shores on top making the structure 100 ft high. Spacing of exterior columns is 69x52¾ ft center to center of members. At three major levels, plywood diaphragms are used for horizontal bracing in lieu of some other system such as steel rods. The tower includes 120,000 fbm of heavy timbers and 10,000 fbm of plywood. Additional lumber brings the total to nearly 150,000 fbm.

On top of the 12x12-in. timbers is a grid of steel beams, necessary as timber members on this level could not resist the high unit crushing stresses. This required 45 tons of steel beams.

The tower is designed for a 10% of gravity horizontal load to make it earthquake resistant. This results in substantial diagonal members many of which are 12x12-in. timbers. Joints resisting tension are made of steel plates with 1- and 1¼-in. bolts. Allowable bolt stress was doubled due to the big factor of safety resulting from the high 1/d and because higher than normal bolt spacing was used. The stress increase substantially reduced the size of the joints. Even so, the tower includes 20 tons of steel plates and 19 tons of bolts.

The tower is founded on spread footings on existing rock with a higher than usual 40,000 psf bearing allowed due to temporary nature of the structure.

The tower cost the contractor nearly $100,000 excluding erection costs. But much of this can be recovered in salvage value. It was fabricated at the Richmond, Calif., plant of Timber Structures Inc. of California and erected by the contractor.

• Cantilever concreting—Because of the great mass of the cantilever arms, design called for them to be cast in several increments. First lift was 15 ft, and this, of course, did not carry the concrete clear out to the outer edge. Then came three successive lifts of 7 ft followed by a final lift of 4-ft thickness. This last lift included all of the deck level reinforcing. Between each successive lift is a series of deep keys to provide shear transfer. These keys are as much as 2 ft 6 in. deep at the lower interface between pours and only 1 ft 1 in. deep at the topmost interface. Depth of the keys is determined by amount of horizontal shear that must be accommodated. The keys include nominal reinforcement. Similar keys are provided in the longitudinal walls that carry thrust from the cantilever overhang back into the main structure.

The cantilever arms are 19 ft wide at deck level providing a 32-ft-square opening for exhaust flame.

• Flame deflection pit—After casting the cantilever and removal of the falsework tower, excavation work started on the flame deflection pit. Configuration of this pit provides for elimination of backflow of exhaust gases into the rocket thrust area. Slope angles of the deflector surface required for deflection of exhaust gases from the jet impingement area without surface spalling of the concrete, were developed from empirical data and latest experience factors.

In typical cross sections the deflection pit is 31½ ft wide at the bottom, has side slopes of ½ on 1 and is 60 ft deep. Bottom slab and walls are some 18 in. thick. The top 4 in. of the flame deflector concrete is made of a special refractory gunite, specifications for which were developed by the Ohio River Laboratory of the Corps of Engineers.

• Functioning of the installation—Included with the facility are a reinforced concrete instrumentation and control building, camera and observation post, ready-rocket fuel, oxidizer, and high pressure gas storage facilities. The high thrust test stand will be capable of statically testing future missile systems and rocket engine power plants up beyond thrust ranges where existing static test facilities are inadequate. Investigation of the propagation of a radio signal through the exhaust flame also may be accomplished to determine what, if any, effects the exhaust flame and gases may have on a guidance and control system.

The test stand proper contains space on a lower deck level for an assembly shop, instrumentation terminal room, an electric substation. Access to the lower deck is from a ramp from the adjacent access road. The terminal room provides space for control rectifiers, stand-by batteries, relay racks, calibration area, gas pressure calibration system terminal racks and power room. The power room is partitioned from the terminal area and

At home in rugged terrain, ruggedly-built Le Roi compressor functions consistently on mountain top after 1500-ft. piece-by-piece air lift.

Contractor Air-Lifts Compressor to Wind-Swept Mountain Top

Le Roi air compressor provides power for test-site uranium drilling, after getting a lift from a helicopter up sheer canyon walls.

Compressor operates in temperatures as low as 20 below zero on 7,000-ft. Wingate formation.

Getting a Le Roi 105 cfm portable air compressor on top of a mountain, bordered by sheer canyon walls 1500 feet high, seems to pose a problem. The Atlas Corporation took the situation in stride when they decided to test-drill for uranium on the 7,000-foot Wingate formation of the Rocky Mountains near Hidden Splendor, Utah.

Dismantling the compressor was the first hurdle in getting it up on the mountain. This was relatively simple because Le Roi machines are designed for accessibility and easy servicing.

Then a helicopter flew the unit up over the canyon walls piece by piece. The compressor was quickly reassembled on the mountain drilling site and went to work.

20 below zero temperatures on the wind-swept mountain range had no effect on the work. The quick-starting Le Roi 105 cfm compressor provided dependable amounts of air power whenever it was needed. Often, the drilling was done nearly a half-mile from the compressor site. Even in this unusual condition, the compressor supplied a steady supply of air for the testing operations.

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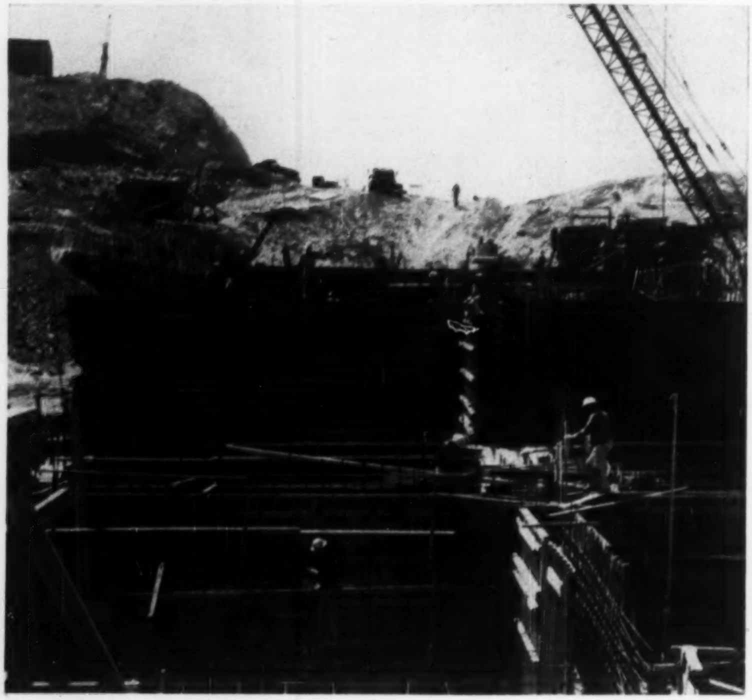

MAJOR PART of the test stand construction is formwork. All forms are plywood faced, backed by timber walers.

shielded. Ready-rocket fuel, oxidizer and high pressure gas storage facilities are situated behind the stand, with transfer lines leading to the engine mount area on the stand.

The instrumentation and control building is a two-story, reinforced concrete structure, completely below finish grade except for the exterior wall of the upper floor away from the blast. An observation room is provided on the upper floor level to afford direct visual observation of the test conducted on the stand. Location of this structure was limited by operational requirements restricting the maximum transmission distance of instrumentation cable to less than 500 ft. As this distance is less than the safety distance defined by the Ordnance Safety Manual, the building was designed as a magazine-type structure to resist, with only slight damage, pressures developed from maximum possible blasts on the test stand. An underground instrumentation tunnel connects the terminal room on the lower deck of the test stand to the instrumentation and control building.

Several observation and camera posts are located opposite the front of the test stand and on either side. The master observation and camera post situated approximately 680 ft in front of the stand is a reinforced concrete structure set below grade to minimize blast effects. All observation and camera posts are air conditioned and furnished with an air supply to operate 30 min. at maximum occupancy with all inlets and exhaust ducts closed.

The instrumentation system of the test facility was designed to accom-

TIMBER TOWER DETAIL shows lateral bracing provided in case earthquake should occur during concreting. Rocky canyon in the background will be paved for flame deflection.

modate all the present and foreseeable future requirements of large missile static testing. Known techniques of rocket instrumentation have been fully exploited. The development of new methods has been realized and sufficient provisions made to accommodate the innovations as field operational capabilities are proven. The prime intent of the instrumentation design was to furnish rocket missile developers with information necessary to realiably conduct the respective test programs.

Top deck of the test stand is served by rail connections to facilitate movement of heavy test units. And while preparing a test setup, the 32-ft-square opening in the cantilever overhang will be closed by a cover plate. This will be moved out of the way on tracks when a test is actually under way.

As stated in the foregoing, criteria for the facility was established by scientists of the Rocket Engine Test Laboratory under the direction of its chief, R. F. Gompertz. Design was handled by The Ralph M. Parsons Co. under the direction of Stanley Goldhaber. Construction is being supervised by the Los Angeles District, Corps of Engineers under the direction of Col. Arthur H. Frye, Jr., district engineer. Bruce W. Bennett is project engineer for the Corps of Engineers. The construction is under the cognizance of the South Pacific Region, Air Force Installations Representative, Col. Edwin M. Eads.

For the George A. Fuller Co., John C. Reid is project manager and C. H. Gruber is superintendent. Directing the concreting work for Carbro Construction is A. J. Trione, vice president. Cost is about $5 million, including construction and instrumentation.

New Ocean-Bottom Samples Are 1-Ft Dia, Undisturbed

Using a new sampling device, geologists of Columbia University's Lamont Geological Observatory advanced their pioneer studies of ocean-bottom sediments. With the new sampler, designed by Prof. W. Maurice Ewing, director of the Lamont Observatory, greater accuracy in sampling is obtained.

Prior sampling with a cylinder 2½ in. in diameter made it necessary to take a sediment layer at least one-half a centimeter thick. The new sampler is 11½ in. in diameter, with the result that a layer of sample about one-fifth the previous thickness will provide enough material for analysis.

According to Observatory experts, true undisturbed samples from depths up to five miles will be obtained from the Atlantic Ocean and the Mediterranean Sea.

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For the entire story, write for Bulletin No. 507.

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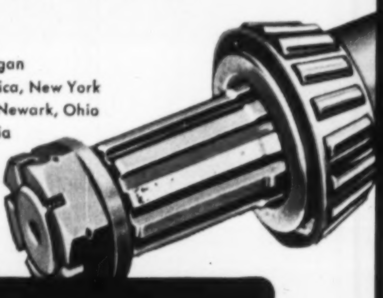

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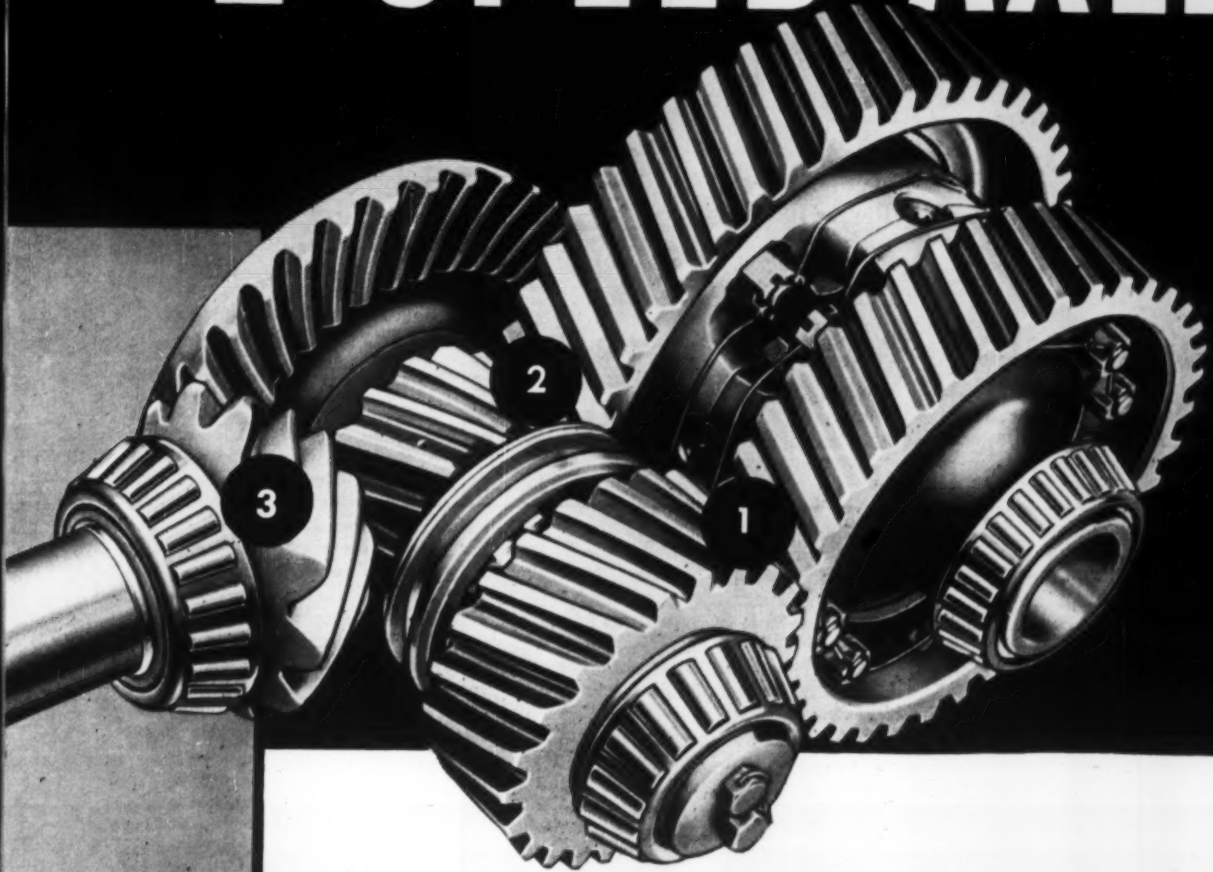

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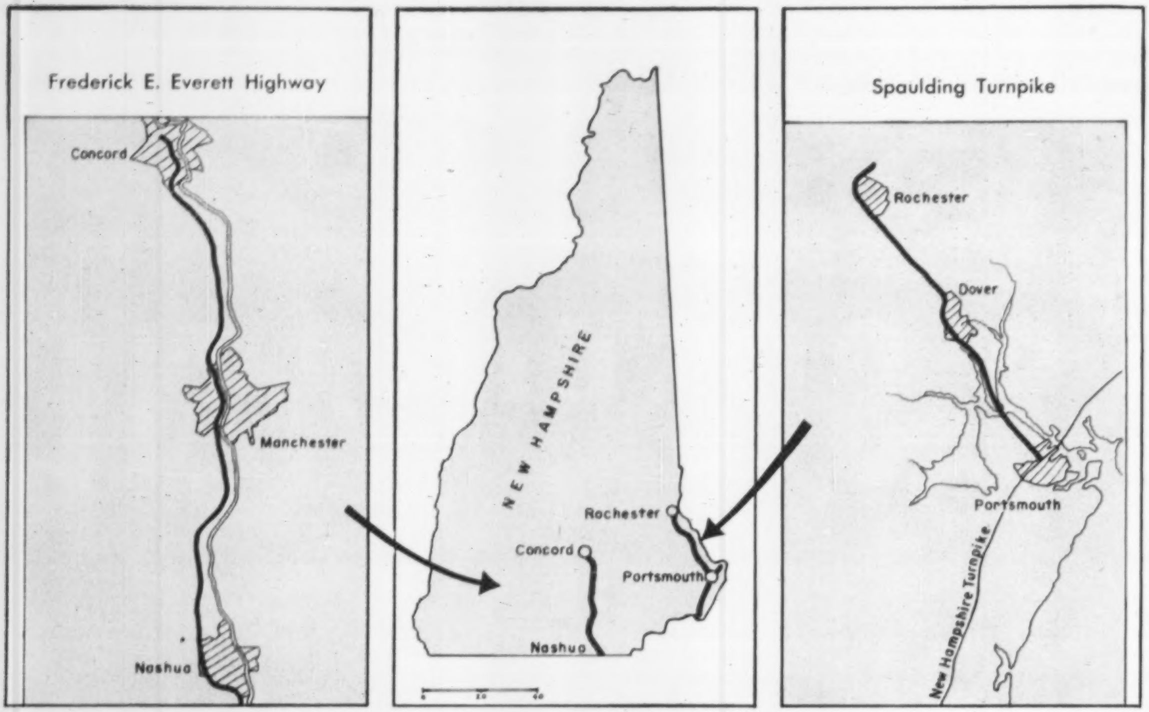


At less than $600,000 a mile—

New Hampshire Builds Two Tiny Turnpikes

Paying strict attention to old-fashioned New England virtues, New Hampshire is now building two toll turnpikes at a construction cost of about $450,000 a mile—total cost, including land, of $600,000 a mile.

By the standards of the great toll roads built over the last five years in other states, New Hampshire's two roads are tiny—they total slightly over 60 miles—but in every other respect they are engineered on par with the biggest and the best.

And there's no easy route to low costs, such as rural areas, cheap land, easy grades. The turnpikes average better than one bridge structure for every mile of road; they thread through industrialized urban areas, there are numerous interchanges, the countryside is rugged.

The secret seems simple, if you listen to John O. Morton, formerly chief engineer and now commissioner of highways for the state:

- All engineering, design and supervision is being handled by the highway department itself—at a final cost estimated at 6% of contract prices.
- Careful exploration of subsoil conditions along the proposed route—and no hesitation in shifting slightly, or taking advantage of each foot of terrain to ease the construction problem. This also entails extensive use of every bit of material—the fine native gravel and sand found along the right-of-way—that can be used without excessive haulage.
- Breaking up contracts into small pieces—$1 million or less—and letting them as fast as designs are available. This brings local contractors onto the job—men familiar with the terrain and the spectacularly independent labor of the area, with their equipment ready to roll.
- Holding design criteria rigidly to the present and anticipated immediate demand—not skimping, but building for improvement later as needed.
- Careful—and quite characteristic—money management.

• Where to and why—New Hampshire (population: 527,000) already has one turnpike even tinier than the two now being built: the 15-mile New Hampshire Turnpike that parallels the state's miniscule Atlantic coastline between Portsmouth—across the Piscataqua River from the terminus of the Maine Turnpike—and the Massachusetts line.

That little turnpike has been fabulously successful. Almost from the day of its opening in 1950, it has exceeded every estimate made on performance. For the fiscal year ending last June, for example, it carried 3,584,439 vehicles—the number estimated for the year 1974; its net revenue for the same year was $576,192—$20,000 more than was predicted for 1977.

With that successful background—and the assurance of a good acceptance for its bonds—the state began thinking about two others five years ago. Planned (by the late Major Gen. Frank D. Merrill, then highway commissioner, and Morton, then chief engineer) were two roads—one on the east coast, to extend 23 miles from Portsmouth in a northwesterly direction to the city of Rochester, along the Piscataqua River; the other in the south-central part of the state, to run from the state line below Nashua through Manchester to Concord, the state capital. Eventually, this central pike may be extended northward to the town of Plymouth in the center of the state's famed vacation country, about 50 miles further north.

Criticism of the central turnpike (officially called the Frederick E. Everett Highway) might be—from a glance at the map (above)—centered

Spaulding Turnpike Literally the end of the road is the belt of woods north of Dover, N. H. Narrow median strip, builtup sub-base of fine native gravel that needs little compaction, wide right-of-way clearances are typical of eastern route.

Everett Highway Most difficult section of central road is through state's largest city, Manchester. Paralleling Merrimac road right-of-way has been cleared of 60-year-old mill building, will pass under bridge through arches at left.

on the fact that its start at the Massachusetts-New Hampshire line is nowhere in particular, and does not provide access to anything but a group of small Bay State communities. However, the starting point was fixed by agreement between Merrill and John Volpe, Massachusetts Commissioner of Public Works, with the thought that Massachusetts eventually would build its dual-lane Route 3—which now ends in the city of Lowell—up to the border to join the central pike.

Construction on the central pike started in November of 1952, and a 21-mile section between the outskirts of Nashua and the center of Manchester is now open (as of late last year), considerably ahead of schedule. Construction of the eastern pike began in May of 1954.

• Money—Putting the state's full credit behind its action, the legislature, in 1953, authorized construction of the two pikes, and a bond issue of $33.7 million to finance them. Of this sum, $19.4 million was to pay for the 40-mile central (Everett) highway, $14.3 million for the eastern (Spaulding).

But, with a good credit rating and the remarkable record of the existing turnpike as guarantees, the state treasurer's office was in no hurry to issue the whole bond issue—nor was the department of highways.

The decision was, rather, to issue the bonds as needed, thus saving considerable interest charges on the full amount, even at the risk of varying rates on successive issues at different dates. The result is that, as of the end of May, a total of $19.5 million of the turnpike bonds has been issued, with rates varying from 1.87% to 2.25%. But the saving in interest payment—if the whole amount had been issued—is estimated at about $900,000.

Careful juggling of available federal funds—with an eye toward quicker construction work and savings of state money has also resulted in a unique condition on both highways, where there are alternating free and toll sections.

On the Everett (central) road, for instance, 13 miles of the total distance are free sections; on the Spaulding (eastern) 12 miles of the total are free sections. Each such section is carefully labelled, and routes or exits to by-passes of the toll stations are prominently noted.

• Site investigation—Meanwhile, the engineering force got busy—with an eye to conserving its own limited forces, and saving money.

First step was a painstaking investigation of soil and subsoil conditions along the proposed right-of-way, and every possible effort to avoid excessive cuts and fills, rock, and structures.

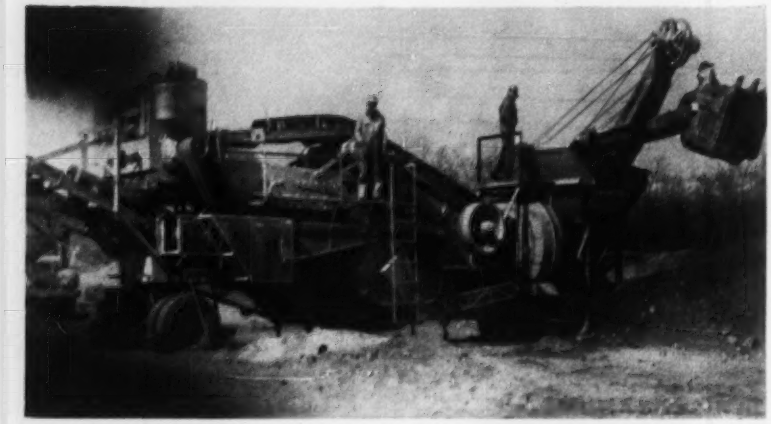
The low rolling hills that border the Merrimac River from Concord south to nearly the state line are generally composed of some of the finest water-washed gravel, sand and crusher-size boulders to be found anywhere along the eastern seaboard. Occasional rock ledges intrude into these hills—they are scrupulously avoided where possible.

On the east coast right-of-way, the area is almost uniformly flat tideland, underlain by firm sand and gravel.

But crisscrossing both routes are numerous small waterways, creeks, and local roads that must be bridged or underpassed. In its 39 miles, the central route has a total of 45 bridge structures ranging from small box culverts to steel structures up to 270 ft in length. In the 23 miles of the eastern road, there are 25 bridges.

The natural sand and gravel makes excellent fill material—requiring very

. . . Turnpikes: Maintenance will be low



SHOVEL LOADS LOADER to load trucks in borrow pit just off central road. With shovel working continuously, trucks can be loaded to full 10-yd capacity in 1¾ minutes.

little compaction. And it grades easily into the required sizes for surface.

The decision was to make use of every bit available on the 300-ft-wide right-of-way. Some sections originally designed as cuts became practically fills instead, with contractors taking out good material from sides of roadbed for fill and aggregate.

• **Engineering**—Designs are standardized wherever possible:

Bridges are of two types: deck-girder structures—simple and continuous concrete slabs on I-beams—supported by concrete piers that stand either on spread footings or piles as subsoil conditions indicate; or box culverts and frames of reinforced concrete. The concrete piers are cast in patented paper forms.

The turnpikes carry dual 24-ft-wide pavement strips, with a 24-ft depressed median, reduced by 4-ft paved shoulders on the inside lanes. (The resulting median, 18 ft wide—reduced to 4 ft in urban areas—is satisfactory, says Morton, and requires only one drainage structure.

Pavements are road-mix asphalt, using native gravels (some crushed to size), purposely left rough in texture for final surfacing at some later date with a smooth asphaltic concrete. Right now, traffic predictions don't warrant the final—and expensive—paving, and the roads are considered safe in New Hampshire's cold climate.

Design speed on the turnpike is 70 mph, design loads are H 20. Grades are held to a maximum of 3%, curvature to 3 deg; sight distances to 1,000 ft.

• **No service areas**—There are no service areas on the turnpikes at all, no gas stations or restaurants, but there are rest areas for picnicking.

Reason: The turnpikes are very short—it is unlikely that any motorist would enter them with less than two or three gallons of gasoline in his tank. There is, however, a highway patrol which will provide a gallon of gas or a tow to the nearest off-turnpike service station if need be—at no charge.

Lack of the service areas eliminates another construction cost—that for exit and entrance ramps; it eliminates interference with traffic; and it eliminates a considerable headache for the highway department in managing and letting concessions.

Even toll collections are 90% automatic—reducing cost of attendants. Out of four lanes in each direction at the barrier-type toll stations at Nashua, for example, only one is attended—and that one is for trucks (which pay 25 cents per axle) and buses (paying 75 cents), and motorists who don't have the correct change for the 15-cent fee.

• **Paving**—In a state where cold weather is normal, and lingers long (it was 18 deg above zero at Concord on May 24) subsurface preparation is particularly important.

Normal sub-base for the turnpikes is 1 ft of crushed gravel and 1 ft of bank run.

Over this prepared base, a tack coat of asphalt is placed, then a 4½-in. crushed-stone layer is placed in two lifts. This gravel layer is put down with spreader boxes, and is cleaned and dried by a pass of a patented screw-type mixer. The aggregate is graded so that 100% will pass a 1½-in. screen, and has fines down to material passing a ½-in. screen.

Next comes 75 gal/st of asphalt spread hot from spray trucks; two complete mixings with the screw-type machines; another "shot" of asphalt, another mixing, then final spreading with a patrol grader and rolling with steel-tired rollers.

Final result is a pavement mat 3 to 3½ in. thick, which is allowed to cure for several days, then finished with a seal coat of asphalt and ½-in. stone.

• **Contractors**—The state's theories on small contracts and small contractors have worked well too. Biggest contract on either turnpike, so far, is a $1.94-million award, of a 1.2-mile section of the Spaulding pike—but that bid (by R. G. Watkins & Son of Amesburg, Mass.) is for a section that includes two full interchanges and five structures. Typical of the smaller jobs is another Watkins contract—$228,796 for a one-mile section of the central road.

Highway department men are unanimous in their praise of the efficiency and quality of the work being done, and the ease of their relations with contractors all of whom are local men—from New Hampshire itself, or nearby points. Of particular interest is their familiar handling of the local labor force—composed of highly skilled men, who are inclined on occasion to "pack in" their jobs in favor of a fishing trip for a day or two. There have been no delays due to labor, no strikes. And bid prices—with stiff competition—have been uniformly low.

Probably the biggest operator on the turnpikes is the R. G. Watkins Company, whose 28 brightly painted 10-ton six-wheelers (Watkins doesn't believe in scrapers in this territory) and other equipment are probably the best-maintained construction equipment to be seen anywhere. Trucks, two huge water wagons, five shovels, other equipment are kept spotless.

With this fleet (plus three rock-body trucks), this contractor is moving up to 10,000 cu yd of earth in an eight-hour day, loading them with a 2-yd shovel that discharges from the borrow pit into a hopper that feeds a belt loader, so that the shovel can work without a break.

On the opposite side of the scale—insofar as appearance of equipment is concerned, but not in production and quality of work—is Peter Salvucci & Son, of Waltham, Mass., with a $1,025,000 contract for four miles of road and one bridge, near Concord. Salvucci's equipment is the oddest mixture of machines—tractors of one type pulling scrapers of another, from beat-up looking rock trucks to newest and shiniest double-end motor scrapers. But he moves his 7,000 cu yd every day—quickly, cleanly.

• **Problems**—Biggest unsolved problem at the moment is the $2-million (esti-

Save time and money on low-cost drainage jobs...

The Harris Brook Bridge, near New Portland, Maine, is a 156"-diameter, 86'-long pipe culvert made from AMBRIDGE Sectional Plate by the Bancroft & Martin Rolling Mills Company, South Portland, Maine.

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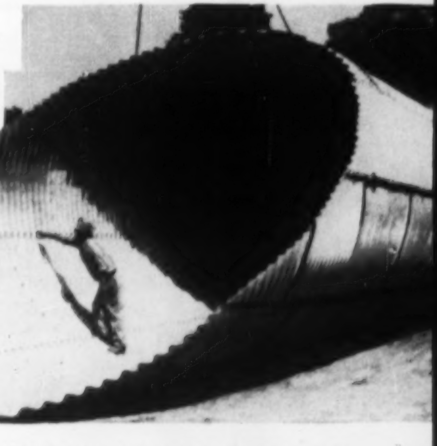
AMBRIDGE Sectional Plate for pipes, arches and pipe-arches meets the specifications of the American Association of State Highway Officials, and can be adapted to all state, railroad and government specifications.

Fabricated in 2" deep corrugations on 6" centers with standard punchings . . . *and galvanized after fabrication,* AMBRIDGE Sectional Plate is furnished to accommodate any shape or size of pipe, arch, or pipe-arch, complete with bolts. Special details, such as asphalt coating, hook bolts, beveled ends, and skewed ends, are furnished as specified for each job.

For further information, we suggest that you contact the office nearest you. Or, an inquiry direct to our Pittsburgh headquarters will bring detailed information.



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AMBRIDGE *Sectional* PLATE USS

UNITED STATES STEEL

GRADERS DO MUCH of the pavement work, including final surface spreading. Crushed washed gravel is placed here in 5-in. lift, preparatory to final cleaning and penetration asphalt "shot".

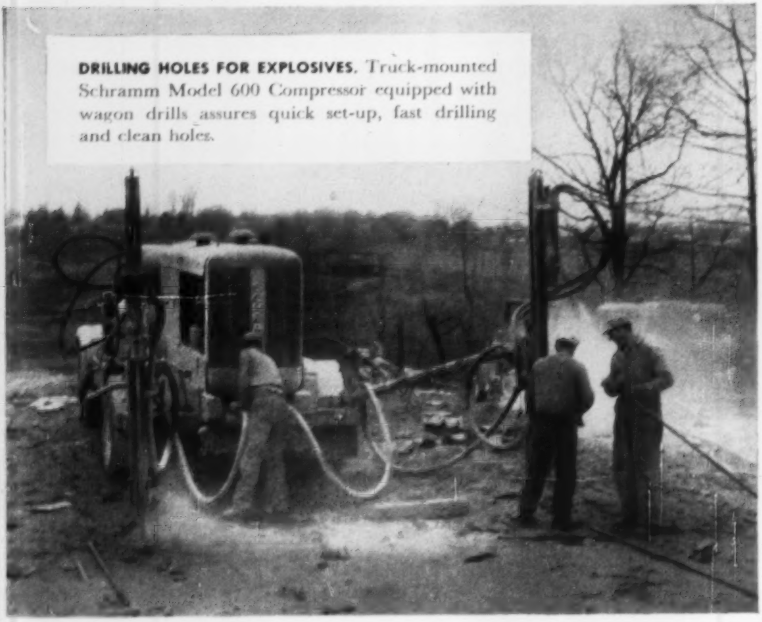
mated) major interchange at Manchester, the state's largest industrial city—and that problem is closely tied to the shortage of structural steel for bridges and piling. (The piling problem has been temporarily remedied at some places by "borrowing" some unused H-beams from neighboring Maine.) Engineers are considering prestressed concrete as a substitute for steel at some points, to ease the pinch.

Elsewhere, state-prison-made concrete pipe is used where possible for culverts and drainage structures.

Manchester itself, with the huge old mills of the now defunct Amoskeag Corp. lining both sides of the Merrimac River, is the big urban problem. The central pike comes almost through the heart of the city, along the west bank of the river, and several structures—including an 1,170-ft-long brick warehouse and a 250-ft-high brick stack have already been removed from the right-of-way. (That stack—which had a 50-ton cast iron ring at its top—is a source of continuing wonder to contractors, as to how that huge ring was raised to the top when the structure was built in 1889.)

Contracts for the Manchester interchange on the central pike—bid in mid-June—will mark the final contracts on the central turnpike. Completion of all work is scheduled for next year, with the eastern pike scheduled to be opened as far as Dover by Labor Day of this year.

With Morton now serving as highway commissioner, turnpike construction is under direct charge of Reuel B. Webb, construction engineer, and R. H. Whittaker, deputy commissioner and chief engineer of the department.



DRILLING HOLES FOR EXPLOSIVES. Truck-mounted Schramm Model 600 Compressor equipped with wagon drills assures quick set-up, fast drilling and clean holes.

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The Schramm Model 600 Compressor operates at 1200 rpm—delivering 600 cfm at 100 lb. Other Schramm Unistage Compressors have capacities of 105, 210 and 315 cfm. Full details are yours for the asking. Write for Catalog No. SPB-56.

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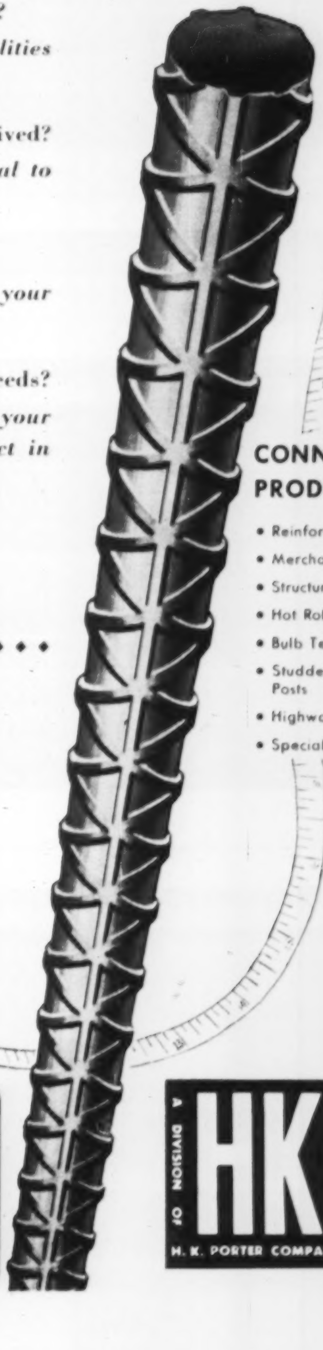

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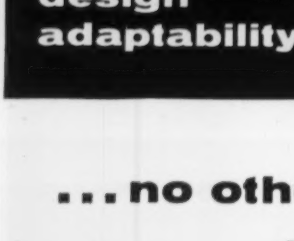

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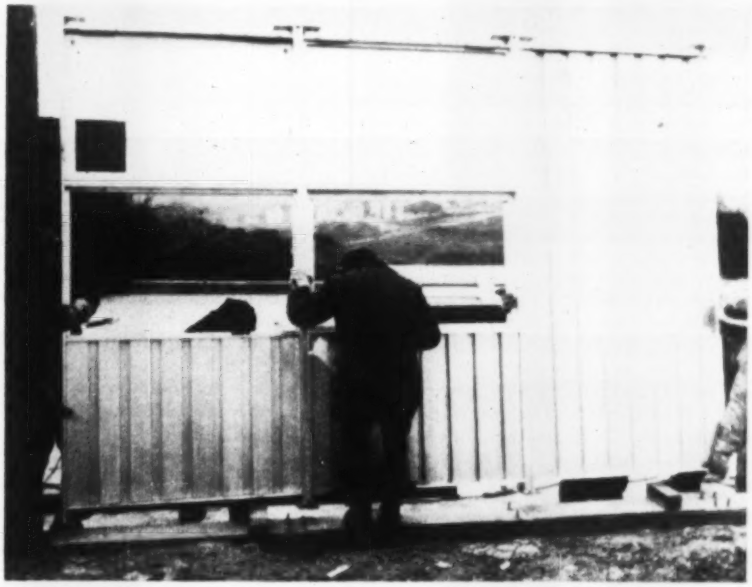


Sandwich Panels Carry Roof Loads

A new load-bearing sandwich panel for one- and two-story structures is said to be fast to erect, lightweight and low-cost. The panel includes integral structural framing, windows, doors and insulation, and carries roof loads without any additional supporting members.

Sandwich panels are 4 x 8-ft prefabricated sections consisting of a flat or extruded aluminum exterior, a $1\frac{1}{2}$-in. glass-fiber core, and an interior sheet of $\frac{1}{8}$-in. hard board. Total thickness is 4 in. Sections weigh under 150 lb each. Four men can erect three factory-joined units.

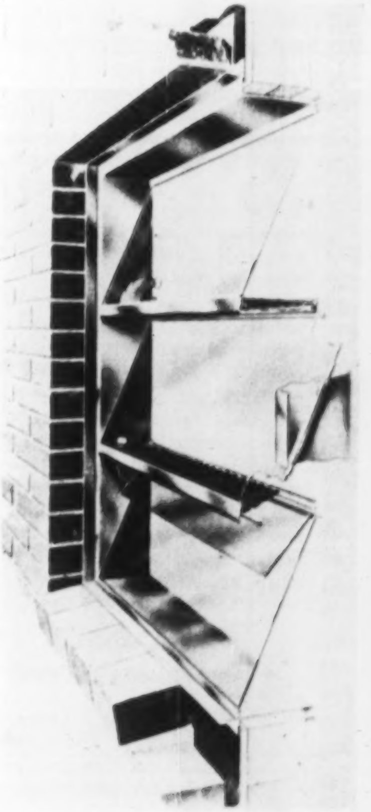
The system, called W-A-E (Weather-Anchor-Expansion), can be used for clear roof spans up to 60 ft. The panels are bolted directly to the floor slab. Specially made roof trusses for flat, shed and ridge roofs rest on and are fastened to panel heads. Other components of the system to be used with the panels include a special window sill, batten seam roof, sunshade coping, extruded wall panels and window walls.

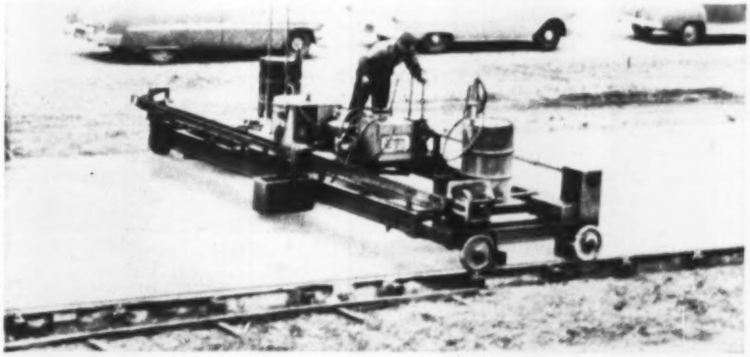
According to the prefabricator, the system enabled a five-man team to erect the walls and bolt on rafters for a 120 x 40-ft church in two days. The steel roof deck was installed in an additional two days. ALUMINUM STRUCTURES, INC., PITTSBURGH, PA.

Z-Type Window Ventilates; Keeps Out Insects and Rain

A new Z-shaped aluminum window section gets away from many of the problems plaguing conventional windows by having ventilation openings located in a horizontal plane. Fixed panes of double-strength window glass comprise the diagonal of the "Z".

Covering the horizontal ventilation opening is a shelflike screen of 16-ga aluminum mesh. The vent is closed





Spray Curing Machine Covers in One Pass

A new line of automatic spray curing machines, claimed to provide uniform coverage of concrete in one pass, is now available from General Road Machines.

The machine is built to travel along the form line behind the finisher and is capable of spraying wax or resin based materials as well as white-pigmented curing compounds. It has a single, track-mounted spray head which passes across the surface of the plastic concrete. The spray head, driven by a hydraulic motor through V-belts and a roller chain, travels the full width of the machine, with automatic traversing cycles of 1-10 per min.

The machine is capable of traction speeds from $5\frac{1}{2}$ to 30 feet per minute and transmissions provide 3 speeds forward and 3 speeds reverse. General Road Machines, Inc., Niles, Ohio.

Darex Diary

No. 12 of a series

by Henry L. Kennedy

Member, American Concrete Institute
Manager, Construction Products
Dewey & Almy Chemical Company
Cambridge, Mass.

***** Proportioning of Air-Entrained Concrete**
***** Dispensing DAREX AEA**
***** Measuring Air Content**

Although I have touched on them briefly in previous issues of the Darex Diary, I believe that the three features I want to discuss in this issue are sufficiently important to justify mentioning them again.

These features are: (1) adjustment of a concrete mix for air entrainment, (2) dispensing of Darex AEA into the concrete mix, and (3) tests to determine the volume of air that has been purposefully entrained.

* * * * *

The proportioning of a given concrete mixture to allow for air entrainment is relatively simple. In most cases, two principal elements must be taken care of: (1) reduce the amount of mixing water per cubic yard of concrete to compensate for the increased consistency that the entrained air causes, and (2) reduce the amount of sand and/or coarse aggregate in the concrete to compensate for the bulking effect of the air that is entrained.

In this approach the cement factor should remain the same in the air-entrained mix as it was in the plain mix and generally the slump must also be the same. Until the proportions can be accurately computed, a good rule of thumb is to reduce the water content by about 30 pounds (3½ gallons) per cubic yard and to reduce the sand content by about 100 pounds per cubic yard. This will adjust the cement content for about 4% air.

Since an air entraining agent is a cost item, its introduction into the concrete mix merits considerable care and precision. Inaccurate dispensing can result in too much or too little air. Remember that under ordinary circumstances we are adding only a small amount of fluid per bag of cement. To assure proper control, I certainly recommend proper dispensing apparatus.

For stationary plants and paving mixers several dependable dispensers are available. They are manufactured by our own Darex AEA distributors: J-W Materials, Inc. of Napoleon, Ohio; E. W. Zimmerman of Chicago, Illinois; and the C. R. Watts Company of Seattle, Washington.

* * * * * *

The control testing of air-entrained concrete differs from plain concrete in only one respect. That is, the new ingredient, air, should be controlled with the same philosophy we apply to such properties as slump, workability, unit weight, etc. Simple tests can determine precisely the amount of air in the concrete. The most popular technique today is the pressure method—by compressing the entrained air, the only compressible ingredient in the concrete. This test takes only a few minutes and is well worth the time to assure full benefits from air entrainment. Two very dependable apparatus for this purpose are the Acme Air Meter (E. W. Zimmerman) and the Press-Ur-Meter (Charles R. Watts Co.).

If lightweight concrete is involved, particularly with porous aggregate it is well to use an apparatus known as the Roll-A-Meter (Charles R. Watts Co.), which determines the air content by displacement of the air with water instead of by pressure.

Lacking an air meter, an alternate means to determine the air content is the ASTM gravimetric method C-138-44. The test involves a comparison of the unit weight of the air-entrained concrete with the unit weight of the same concrete air-free.

DA

DEWEY AND ALMY
CHEMICAL COMPANY
DIVISION OF W. R. GRACE & CO.

Cambridge 40, Massachusetts; San Leandro, California, Montreal 32, Canada

by a $\frac{3}{16}$-in. jalousie-type pane which is operated by an adjustable finger control. Vinyl plastic weatherstripping provides the seal.

According to the manufacturer, the new window—called Z-Louve—reduces installation costs, eliminates screen problems, minimizes condensation damage and virtually does away with maintenance. Advantages are:

- Burglarproof because vent openings are impassable—even with a broken pane, it offers only a 1-ft-high opening.
- Dustproof when closed because its infiltration seal is tight.
- Safe since children cannot fall through or lean out of this window.
- Easy to clean—window can be cleaned from the inside.
- Rainproof feature eliminates need of closing windows during storm.
- Draft-free ventilation since incoming air is directed to the upper part of the interior.

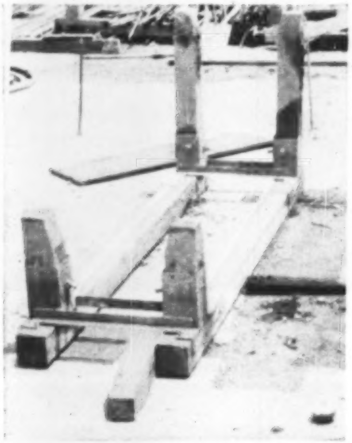
The Apache Co., Inc., 410 E. Magnolia Ave., Fort Worth, Tex.

Material Spreader for Use With Standard Dump Truck

An improved material spreader that can be used for salt, sand and cinders has been announced by The Fairfield Engineering Co.

The manufacturer says that the new machine features simplicity of installation and ease of operation, and will fit any standard 3-cu-yd dump-body tailgate. Complete control of the material being spread is located in the truck cab and operated by the driver, eliminating the extra man on the back of the truck.

Readily adjustable baffles are provided at the distributor disk to control the spread width. The unit is said to be able to spread over two highway lanes and can throw the material forward for better traction for the carrying truck. Fairchild Engineering Co., Marion, Ohio.



Bracket Simplifies Job Of Building Runway Trestles

A new runway bracket, developed on the job in Los Angeles, is available for use by contractors.

The brackets are said to be rack-free, simple to assemble and easily knocked down when not in use. Additionally, it is a very simple matter to exchange legs, depending on the necessities of the job.

The bracket was developed by Neil Drinkward, job superintendent for the Del Webb Construction Co., and Bob Squire of Superior Scaffold Co. SUPERIOR SCAFFOLD CO., 5624 BANKFIELD AVE., CULVER CITY, CALIF.

Materials-Handling Vehicles Get Tested Steering Aid

A steering aid that has performed successfully on farm tractors for several years has recently been made available for materials-handling vehicles of short wheelbase and small turn wheels. The unit is a combination steering wheel and automatic clutching device that eliminates shock and kick-back, and acts as an automatic pilot, according to the manufacturer. The steering aid holds the steering gear stationary regardless of bumps, obstacles, stacks or building columns. The unit is self-contained, has no hydraulic or electrical mechanism and is permanently lubricated and sealed. KOSCH MANUFACTURING COMPANY, COLUMBUS, NEB.

German All-Purpose Hydraulic Shovel

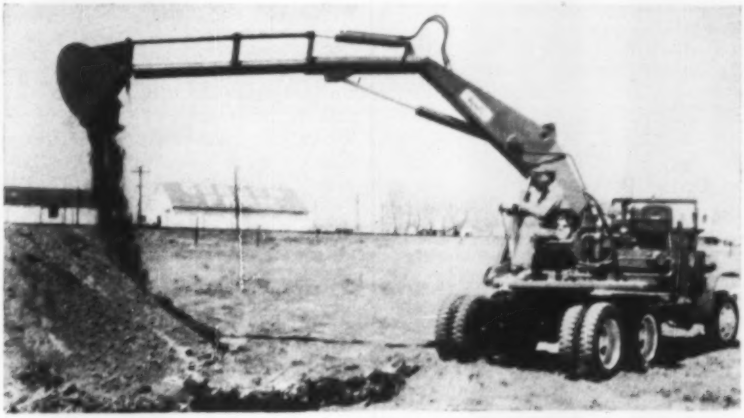
A German-made hydraulic shovel, mounted on a truck body, and operating on ball bearing turntables, is now available in the U. S.

The machine, known as the Yumbo, is an all-purpose tool which carries attachments that include a ¼-yd backhoe, a ⅜-yd front dump bucket, a ⅜-yd rock bucket, a ⅜-yd gravel bucket and a 6,500-lb crane hook.

The backhoe is said to have a digging depth of 10 ft and a clear dumping height of 10 ft. The shovel has a similar dumping height.

The turntable consists of lower and upper races, integral gear and center race, and 168 ball bearings. The machine is said to be the only shovel with a ball-bearing turntable with two races of balls working in compression, reducing friction to a minimum.

The hydraulic system provides power for penetration on all backhoe and shovel digging operations and also eliminates gears, chains, sprockets, sheaves, cable and other accessories. All the controls are spring loaded to return to neutral position when released. GECO, INC., 5701 COLORADO BLVD., P. O. BOX 177, DENVER, COLO.



Darex
products at work

DAREX AEA
goes underwater
to untangle
traffic knots

Problem: how to untangle traffic knots
in crowded Baltimore and hustle the heavy
through-traffic across town?

Engineers saw a dramatic solution. They're slicing straight across, deep under the Patapsco River, with twin tubes, each 32 feet in diameter and 6300 feet long. A project of the Maryland State Roads Commission, the tunnel will be largest of its type in the world; only the most durable materials will serve.

Contractors Merritt-Chapman & Scott are using DAREX AEA as the air-entraining agent, adding it to the more than 250,000 cubic yards of concrete that help strengthen the tube's steel shell. Within the tube a two-foot layer of DAREX air-entrained concrete adds permanent strength. Outside, a two and one-half-inch concrete coating protects the steel from the river waters.

Beyond improving the finished quality of the concrete, DAREX AEA is helping in easier placement and faster finishing on this $30,000,000 project.

Write today for more information about DAREX *AEA.*

Other Dewey and Almy Products for the Concrete Industry

DARACONE—silicone-type water repellent

DARALITE—air-entraining agent for use with lightweight aggregates

DARASEAL—premium quality concrete curing compound

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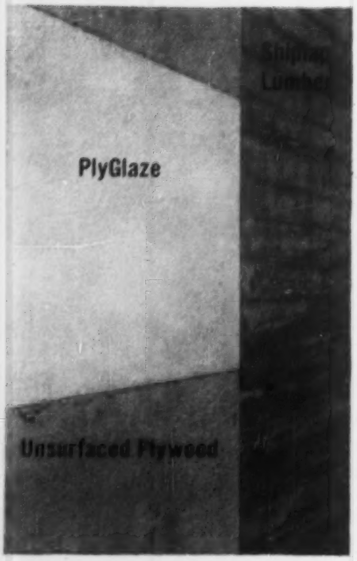

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Publications

Disposal by landfill—"Questions and Answers About Sanitary Landfill" is the title of a recently published booklet on this common form of refuse disposal. Intended for city officials and citizens alike, the booklet includes a comparison of various landfill methods. The publisher points out that the U. S. Public Health Service, after considerable study of the operation, highly recommends it as an effective means of garbage and refuse disposal. The booklet also outlines equipment requirements for landfill operations of various sizes and cites locations where the application of the method have been highly successful. Available in English, Spanish, Portugese and French. Form DE620. CATERPILLAR TRACTOR CO., PEORIA, ILL.

Precast insulated stacks—Indexed in four categories, an 80-page literature file gives comprehensive information on the Van-Packer Pre-Cast Insulated Stack. Categories are (1) General Information, (2) Specifications and Ordering Data, (3) Installation Instructions, including guying methods, and (4) Performance and Physical Characteristics. The Van-Packer is a precast, refractory stack for use with boilers, furnaces, ovens and incinerators where flue gas temperatures do not exceed 1,600F for continuous exposure. The stack is made up of cemented 3-ft lengths of precast vermiculite concrete with an aluminum outer jacket. VAN-PACKER CORP., BETTENDORF, IOWA.

Butterfly valves—Extending beyond their traditional field of special application valves, Allis-Chalmers has announced a new series of butterfly valves designed primarily for municipal waterworks. In a new bulletin, the growing popularity of butterfly valves is discussed and details of construction, installation and operation are presented. Also included is a classification of the valves according to service pressure and pipeline velocity, corresponding to recent AWWA standards. Bulletin 02 R 8287, HYDRAULIC DEPT., ALLIS-CHALMERS MFG. CO., MILWAUKEE 1, WIS.

Laboratory analysis—"Much New Information" is the description of a catalog on lab procedures and equipment from the Hach Chemical Company. The literature lists simplified procedures for water analysis, portable testers, and standard lab apparatus. A modification of the persulfate method for manganese is among the new procedures listed. The technique eliminates the filtered removal of chloride, requires only two reagents and can be performed in five minutes or less. Catalog No. 4. HACH CHEMICAL CO., IOWA.

Vermiculite specifications—The 12-page booklet, "Standard Specifications for Vermiculite Plaster and for Vermiculite Acoustical Plastic," has been revised to include new provisions of the American Standards Association Specification for Gypsum Plastering. Added is a new section on machine-applied vermiculite plaster. The specification for vermiculite acoustical plastic has been completely revised to include machine application. VERMICULITE INSTITUTE, 208 SOUTH LASALLE ST., CHICAGO 4, ILL.

Corrugated filler strips—A 10-page illustrated booklet describes asphalt and rubber filler strips to seal corrugated building panels. Included in the bulletin are application ideas and physical properties and specifications for Permi-Seal Filler Strips. ASPHALT CORP. OF AMERICA, DANVILLE, ILL.

Steel reinforcement—Use of welded wire fabric reinforcement in concrete pavements is the subject of a technical bulletin issued and distributed by the American Road Builders Assn. in July. WIRE REINFORCEMENT INSTITUTE, DEPT. 217, NATIONAL PRESS BLDG., WASHINGTON, D. C.

Power digger—Sherman major power digger literature now is available, providing details of this new hydraulic backhoe said to be designed specifically for attachment to Fordson-Major tractors. SHERMAN PRODUCTS, INC., 3200 W. 14 MILE ROAD, ROYAL OAK, MICH.

Diesel engines—The answer to many questions about the composition, manufacture and operation of diesel engines is contained in a 24-page booklet called "Answers To Questions About Diesels" released by the CUMMINS ENGINE CO. CUMMINS ENGINE CO., INC., COLUMBUS, IND.

Ditchers—A 16-page catalog covers recently introduced Gar Wood-Buckeye 305, 307, and 308 pipeline and utility ditchers, describing new engineering developments, and other new features. GAR WOOD INDUSTRIES, WAYNE, MICH.

Piling operations at Structure 53-5, Indiana Toll Road. Pile Diameter: 12", Wall Thickness: .172", Hammer: Vulcan No. 1

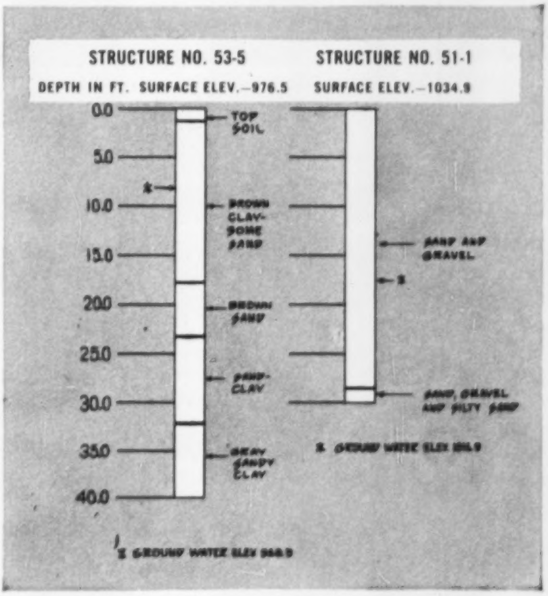
How Armco Pipe Piling Met Varying Foundation Requirements on the Indiana Toll Road

Soil Logs for Typical Grade Separation Structures Illustrate Different Driving Conditions

The soil logs reproduced here illustrate the widely varying conditions encountered at the site of two typical grade separation structures on the Indiana Toll Road. Under structure No. 51-1, hard driving sand and gravel; under structure No. 53-5, relatively easy driving clay.

In both cases Armco Pipe Piling provided the efficient answer. It withstood up to 100 blows per foot to reach the required minimum 20-foot penetration at structure 51-1. In the less stable soil at Structure 53-5, penetrations of more than 40 feet were needed to meet the same 30-ton bearing requirement. The constant cross section of Armco Piling made it easy to splice. Cut-offs could be salvaged. And high collapse resistance assured straight piles, easily inspected for watertightness.

Write us about your foundation problems. Your nearby Armco man will be glad to show you performance data on Armco Pipe Piling in a wide range of driving conditions. Armco Drainage & Metal Products, Inc., Welded Pipe Sales Division, 4756 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.

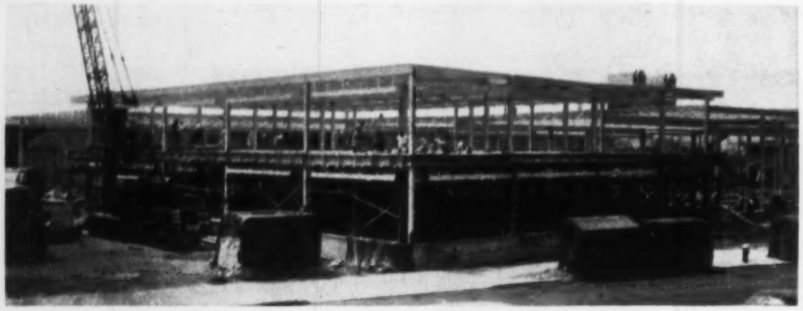

STRUCTURE NO. 53-5
DEPTH IN FT. SURFACE ELEV.—976.5
STRUCTURE NO. 51-1
SURFACE ELEV.—1034.9
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
TOP SOIL
BROWN CLAY-SOME SAND
BROWN SAND
SAND-CLAY
GRAY SANDY CLAY
SAND AND GRAVEL
SAND, GRAVEL AND SILTY SAND
GROUND WATER ELEV.
GROUND WATER ELEV.

ARMCO PIPE PILING

ARMCO ®

How Safety gets the credit

33rd contract with Charles Pfizer & Company! Aerial view shows Pfizer's new Groton, Conn. plant—largest pharmaceutical manufacturing plant in New England. Constant maintenance of high safety standards has kept accidents to an absolute minimum during the nine years that W. J. Barney Corp. has worked at this site.



9th contract with Canada Dry! Photo shows modern, complete bottling plant (approximately 201,000 sq. ft.). Foundations are continued on piles and framed with nearly 1,000 tons of structural steel. Once again, close cooperation between contractor and American Mutual safety experts kept accidents down . . . profits up.

10th contract with New York Telephone Company! New office building presently under construction in uptown Manhattan for the New York Telephone Company was designed by Voorhees, Walker, Smith & Smith. By pre-planning all jobs for safety, W. J. Barney assures continuous operations and completion of schedules on time . . . helps bring in "repeat business."

at W. J. BARNEY CORP.

BY MR. FRIENDLY

During the last year alone, this contractor saved \$9,245* on compensation insurance by minimizing accidents through close cooperation with American Mutual Safety Engineers.

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What's more, from 60% to 70% of W. J. Barney's annual business is repeat contracts—thanks to their cost-saving safety record and quality workmanship! From management through supervisors and foremen—down to the last man on the job—W. J. Barney works hand in hand with American Mutual Safety Engineers. By cutting accidents, they save lives, limbs, and money too . . . are able to keep bids low for a greater competitive advantage.

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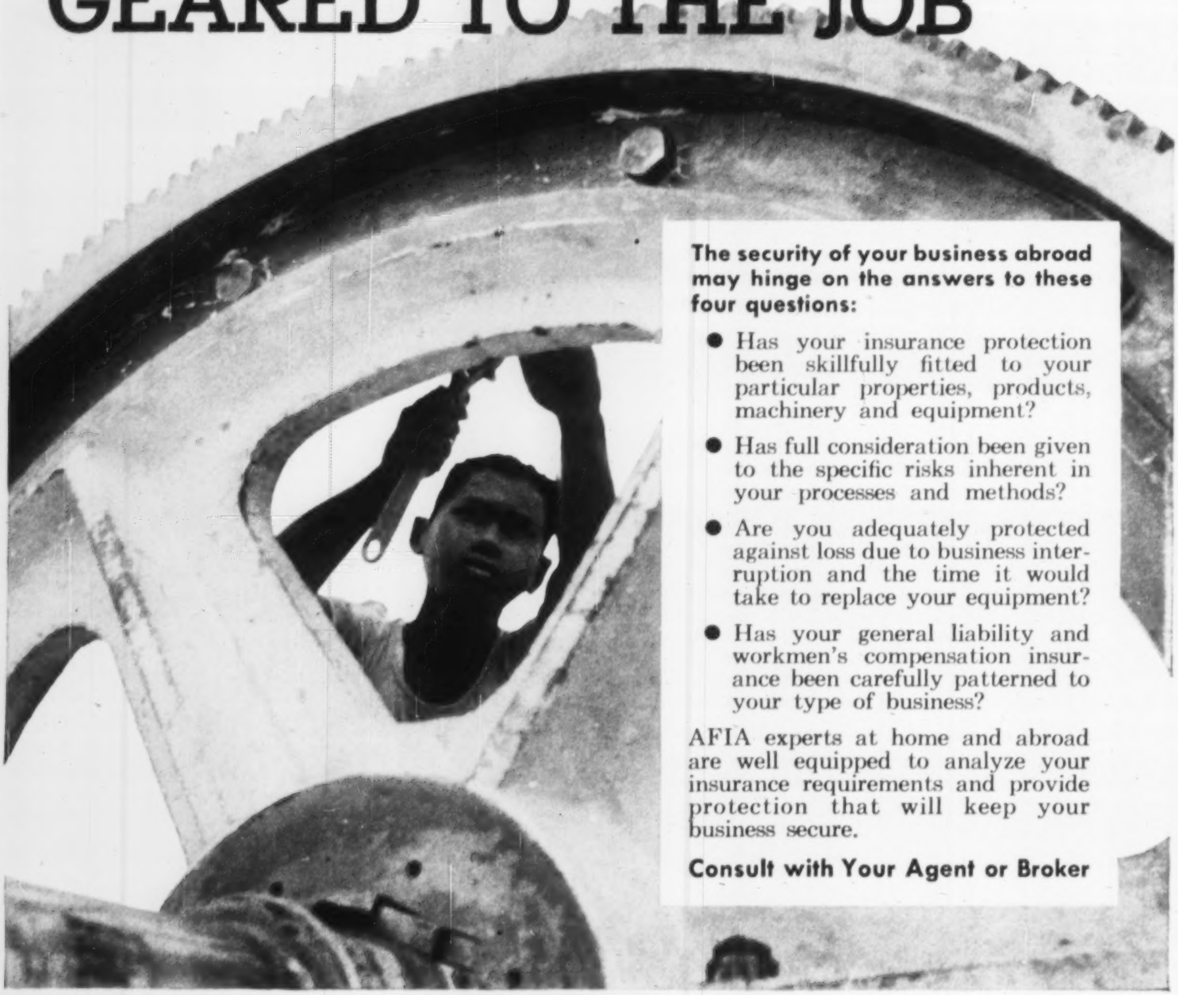

The security of your business abroad may hinge on the answers to these four questions:

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- Are you adequately protected against loss due to business interruption and the time it would take to replace your equipment?
- Has your general liability and workmen's compensation insurance been carefully patterned to your type of business?

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Australian Dam

American joint venture awarded Adaminaby job

A joint venture group of contractors under sponsorship of Kaiser Engineers Division of Henry J. Kaiser Co. has been awarded a $12-million contract for completion of 390-ft Adaminaby Dam, in New South Wales, Australia.

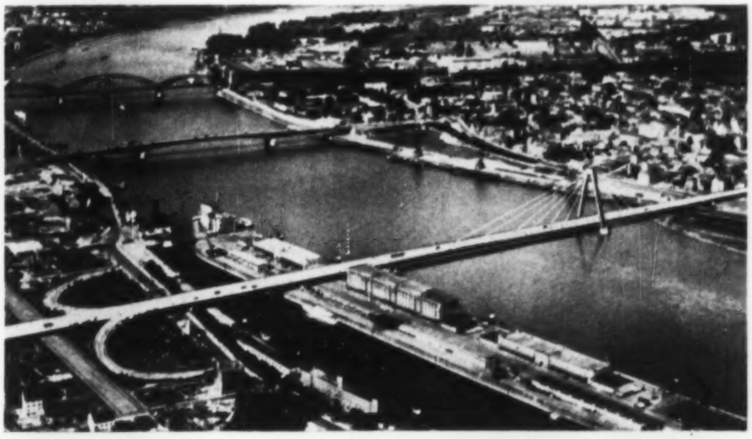
The structure, one of highest earth- and rock-filled dams in the world, is a major part of Snowy Mountains hydroelectric development in southeast Australia, contracts for which have been let to Norwegian and French interests besides the American group.

Located near Adaminaby, the dam will block Eucumbene River, creating a reservoir of 3,500,000 acre-ft of water to be diverted into 14-mi tunnel under construction by Kaiser-Walsh-Perini-Raymond since early 1954.

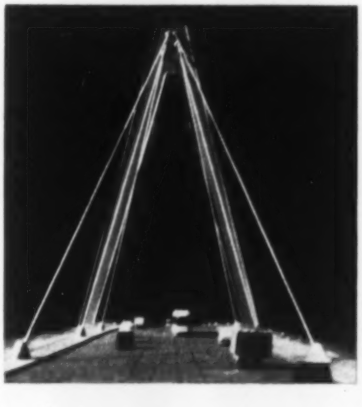
Adaminaby Dam, scheduled for completion in 1960, will be 390 ft high 1,500 ft long. It will contain 9,000,000 cu yd of earth and rock. The dam will store more than a billion gallons of water. Its completion by the joint venture group will coincide with completion of a 25-ft-dia 14-mi tunnel, diverting the Eucumbene River from a southeasterly to a westerly course. Adaminaby Dam will enable an average of 300,000 acre-ft of water yearly to be released to irrigation areas of Murrumbidgee Valley—500,000 acre-ft by 1962.

The Snowy Mountains development includes seven dams, 80 mi of tunnel and 17 power stations (ENR Feb 17, '55 p. 172).

Associated with Kaiser on the project are Walsh Construction Co., New York; B. Perini & Sons, Inc., Mass.; Raymond Concrete Pile Co., New York; General Construction Co., Seattle; Bates & Rogers Construction Corp., Chicago and The Arthur A. Johnson Corp., New York.



Novel Bridge for the Rhine at Cologne



A single-tower suspension bridge will be the next crossing of the Rhine River at Cologne, Germany. Recently placed under construction, it is drawn above on an air view of its site, with the existing Deutz and Hohenzollern bridges shown downstream. The scale model at the right shows the 200-ft triangular tower and the 75-ft deck. The bridge will be 2,300 ft long overall. The longest span, from the tower to the island, is 990 ft. Cables extend out to the midpoint of this span and to an equal distance on the opposite side of the tower to support the 500-ft span there. Called a "counterpoint" design, it is the product of Gutesoffnungshutte Sterkrade, A.G.

Floating Water Plant

1,200-gph capacity unit to supply Iraq village

A floating water purification plant of nominal 1,200-gph capacity has been recently shipped to Iraq by a British manufacturing firm. It is intended to supply a village with water in an area where low-lying ground and swampland prevail and where river levels vary as much as 40 ft.

The floating plant is 10 ft wide and 39 ft long and draws a maximum of 6 ft 11 in. of water. Rated capacity is against an 80-ft head. Storage of 200 gal, or ten minutes worth of rated flow, is available.

The plant is floated by two buoyancy tanks running the length of the "vessel." Beneath these are two interconnected sedimentation tanks, each also running the length of the plant. Water enters a screened intake on the downstream end of one of these tanks and flows by gravity through the entire length of both tanks. Alum is injected close to the intake. Settled water continues through a rapid sand filter located between the clarifiers. Filtered water drains into a purified water tank built around the filters. Chlorine is introduced here.

Up to this point, flow is entirely by gravity and is controlled by the water level in the purified water tank. Pumps then lift the water into two surge tanks located between the buoyancy tanks. The surge tanks are kept about one-third full of water (200 gal) and under a maximum of 40 psi pressure by compressed air. Tanks are connected to the main supply lines.

• Automatic operation—Operation of the pumps feeding the surge tanks is controlled by a pressure switch actuated by the compressed air therein. The pumps draw down the level in the purified water tank and thus induce flow into the sedimentation tanks and through the filters. Pump operation also triggers injection of chlorine and alum.

The floating unit operates automatically, requiring only a brief daily inspection to check water level in the surge tanks and to clean the sedimentation tanks and filter. The latter is washed in the normal manner, by upflowing water.

• Manual cleaning—Clarifying tanks are shaped with a narrow gully along the bottoms into which sludge settles.

For cleaning purposes, a hinged flap is lowered manually and isolates the gully except for small inlet and outlet spaces at each end. The outlet space is connected with an air lift which induces a 23-fpm flow through the gully. A manually operated scraper mechanism is used to loosen the sludge.

For locations where no local electricity supply is available, provision has been made for mounting a diesel-engine-driven generator on the floating plant.

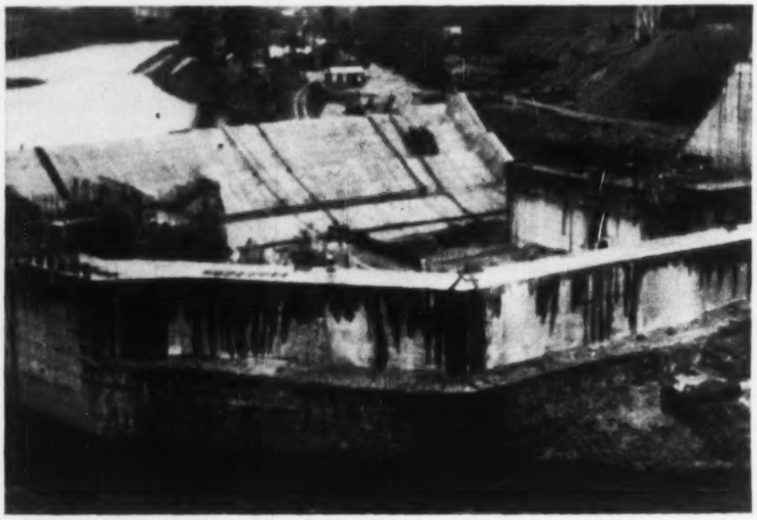
Tanks of the plant are constructed of welded 6-ga aluminum alloy. They are assembled in a bolted frame of structural steel, protected from corrosion by zinc and aluminum coatings and bituminous paint.

Marston Excelsior, Ltd., of Walverhampton developed the production version of the floating water plant, first constructing and testing a prototype built from an outline design by G. Smethurst, chief engineer of the Baghdad District Water Board in Iraq.

India Hydro Project Gets Canadian Financing

Announcement has been made by the Madras State government in India that the Canadian government has agreed to provide $20 million in foreign exchange assistance toward its proposed Kundah hydro power project, which is to be located in the Nilgiris section of the state.

This will be another installation on Madras' great Cauvery River system already developed by four other plants. The first of these is at Mettur on the main river, where one of the world's largest masonry dams, 5,300 ft long and 200 ft high, was completed in 1934, with a power plant of 50,000 kw capacity. Completed within the last few years is the Lower Bhavani project



Cofferdam Built to Take Big Floods

Even though Argentat Dam, which Electricite de France is building across the Dordogne River, is a relatively small structure, there is nothing makeshift about the cofferdam built to protect its construction. Shutting off half of the river at a time, it is a sturdily built watertight box with as much an appearance of permanence as the dam itself. High enough to shut out the annual floods of 30,000 cfs, it can be overtopped without undue damage by the record flow of nearly 150,000 cfs.

An enclosure of cut-off walls of interlocking concrete sheetpiles extends through the riverbed alluvium to rock. On top of this is a 3-ft-thick concrete wall backed upstream and down with a sloping embankment made of rock-filled bags. And finally the slopes inside are paved with concrete.

Being constructed within this cofferdam is a concrete gravity section dam, 115 ft high and 630 ft long, equipped with a four-sector-gate spillway and pierced by two openings for horizontal-axis turbines of the types being studied for installation in France's tidal power plant on the English Channel Coast (ENR June 14, 1956, p. 36).

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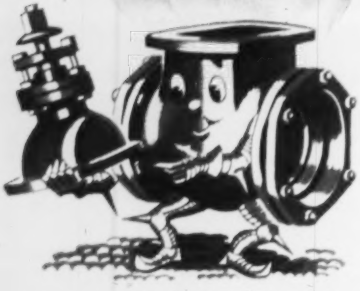

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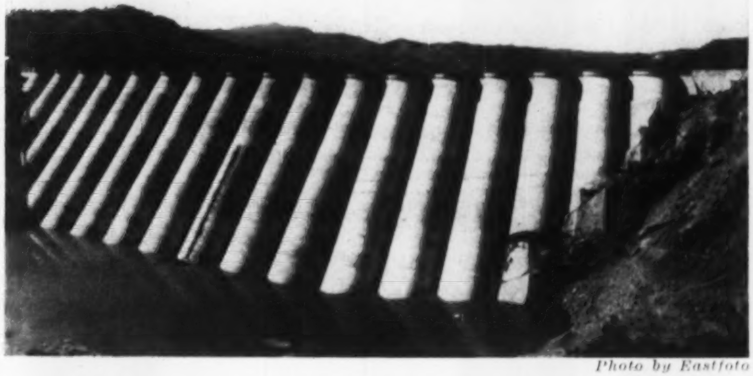


Photo by Eastfoto

Multiple-Arch Dam Is Multipurpose

Sixteen arches span the Hwai River, west of Shanghai on the Chinese mainland, to form Meishan Reservoir for flood control, irrigation and a 24,000-kw power plant. The newly completed dam is 1,775 ft long and 290 ft high. It compares in size with 287-ft Bartlett Dam built in Arizona in 1939.

on the Bhavani, a tributary of the Cauvery, which includes one of the worlds longest dams, 29,400 ft, of which 1,523 ft is masonry and the rest earth. Built largely for irrigation purposes, this project also develops some power.

There are also two plants on the Moyar River, a tributary of the Bhavani–one is situated at Pykara and another, just completed, at Moyar, which adds 36,000 kw to the State's grid.

The new project at Kundah will also be on the Moyar, and will have an initial capacity of 145,000 kw, later to be increased to 180,000 kw. Kundah will cost $74 million. With the foreign exchange problem solved, so that the electrical equipment can be bought abroad, it is expected that construction work will be getting under way soon, headed for a completion date in 1961.

Argentina Sets Up Funds For Five-Year Road Plan

An expenditure amounting to $83.3 million for construction of secondary roads in the next five years has been authorized by the Argentine provisional government.

The highways under this program are intended to improve transportation between farm areas and production centers, railway stations, ports and existing paved highways.

Of the funds, 40% is to be spent by provincial governments, 60% by the National Highways Administration.

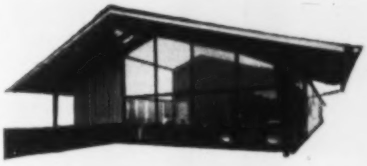
Dutch Polder System Eyed For Use in Rhodesian Project

Plans for controlled irrigation of a half-million acres of unused land have been issued by the government of Northern Rhodesia. The acreage, most of it unmapped and unexplored, lies in the Kafue Flats region, a stretch of land 150 miles long and 35 miles wide at its broadest point along the banks of the Kafue River. Total area of the flats is 1,300,000 acres, which have been subjected annually to inundation by the river in flood.

In the recent announcement, the government gave details of a report by a Dutch consulting firm, International Landbouwadvies Bureau of Arnhem, Holland. The report envisions creation of large polders–low land protected from inundation by dikes–planned on the historic Dutch scheme. The polders would be intersected by canals, dividing the area into individual farms. The consultants' report sets a probable total cost of $56 million for necessary reservoirs and polder works.

The report emphasizes need for exploratory work and suggests that the plan first be tried on a pilot scale covering 1,000 acres. The Rhodesian Selection Trust, in which the American Metal Company of New York has controlling interest, has undertaken to finance such a pilot scheme with the government's approval. If the scheme proves successful, the Northern Rhodesian Government has indicated it will support the complete development.

Don't build an eye-sore



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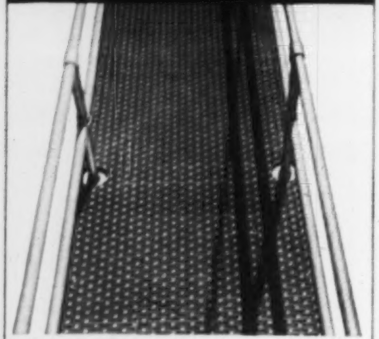

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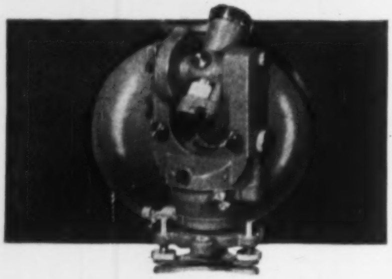

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Men and Jobs

Heald, Engineer-Educator, To Head Ford Foundation

Henry T. Heald, the civil engineer educator who rose to be chancellor and president of New York University, will leave that post to become president of the Ford Foundation next October 1.

While at NYU, the 51-year old ex-president of Illinois Institute of Technology served New York State as chairman of the Temporary State Commission on Educational Finances. He will now join an organization which has made educational finances a prime interest, having just recently established a $500-million grant to colleges and hospitals.

The remarkable Heald career began in a structural design job after graduation from Washington State College in 1923. In 1927 he joined the faculty of Armour Institute of Technology in Chicago as an assistant professor of civil engineering. By 1938 he was president of the school, which had become Illinois Institute of Technology. In 1952 he came to New York to head a university having 38,000 students.

A past president of the American Society for Engineering Education, Professor Heald is also a member of the American Society of Civil Engineers.

Ga. Tech Names Heffernan Director Architecture School

Paul Malcolm Heffernan, professor of architectural design at Georgia Institute of Technology, has succeeded Prof. Harold Bush-Brown as director of the institute's School of Architecture.

A member of the Georgia Tech faculty since 1938, Heffernan holds a bachelor's and a master's degree in science from Iowa State College and a Master of Architecture degree from Harvard University. He is a registered architect in Georgia and an active member of the American Institute of Architects. Since coming to Georgia Tech, Heffernan has collaborated with Bush-Brown and James H. Gailey, professor-emeritus of architecture at the school, in the design of several multi-million-dollar buildings constructed on the campus, including the Hightower Textile Building, the Architecture Building and the Price Gilbert Library. He has served also as consultant to a number of Georgia architectural firms and government agencies.

Heffernan's string of honors and awards include the 1935 Paris Prize of the Society of Beaux Arts Architects to travel in Europe and study at the Ecole des Beaux Arts in Paris. Last year, he received a citation from the AIA College of Fellows for excellence in the teaching of architecture.

American Bridge Shifts Two Contract Managers

John H. Long, Assistant to the Vice President–Contracting, of United States Steel Company's American Bridge Division, has been transferred to the New York Office. At the same time, Walter Schielke, now contracting manager at Birmingham, was named assistant to the Vice President –Contracting, and transferred to the Houston Office to succeed Long.

New Architect-Engineer Firm Formed in Miami, Florida

Three professional engineers and a retiring school architect have formed a new architect-engineer partnership in Miami, Fla., under the name Connell, Pierce, Garland & Friedman. The firm will design and supervise commercial, industrial and institutional projects.

Maurice H. Connell, senior member, and partners Harvey F. Pierce and Edmund Friedman are the engineer members of the group. All three are fellows in the Florida Engineering Society and members of the long-established Miami engineering and design firm, Maurice H. Connell & Associates, Inc. The latter firm will continue its present operations.

James E. Garland, the architect partner in the new firm and a member of the American Institute of Architects, is the present Dade County (Miami) school architect and former Florida State school architect.

Former District Engineer Joins Bridge Company Staff

Col. Gilbert M. Dorland retired on June 30 after 20 years of service with the Corps of Engineers. He has joined the executive staff of the Nashville Bridge Co. in Nashville, Tenn.

His last tour of duty was as Nashville District Engineer, where in four years he was instrumental in pushing Old Hickory and Cheatham Dams on the Cumberland River from a starting stage to near completion.

Col. Eugene J. Stann succeeds Dorland in Nashville. This district will handle construction of $167-million Barkley Dam on the lower Cumberland, for which starting funds just have been appropriated by Congress.

Southern Pacific Railway Changes Bridge Engineers

With the retirement of J. P. Dunnagan after more than 40 years of service, Victor R. Cooledge has been named engineer of bridges for the Southern Pacific Railway.

Dunnagan, who had headed the bridge section for 14 years, first joined S-P as a draftsman in 1916, and was a 1914 graduate of Stanford University. Cooledge joined the railroad in 1926 as an estimator in the engineering department, and became assistant engineer of bridges in 1953.

Men and Jobs Briefs . . .

- **Business**—Pomeroy and Associates, consulting civil and chemical engineers of Pasadena, Calif., announces that **Carl B. Johnston,** former staff engineer for the Los Angeles Regional Water Pollution Control Board, joins the firm . . . **William C. Swalley,** former vice president of Wellman Engineering Co., is named president of F. D. Cummer & Sons Co., Cleveland, builders of asphalt plants . . . **Nelson A. Kenworth,** consulting engineer, establishes offices in New York City to furnish advisory and consulting services on building construction and real estate managament . . . The Pennsylvania Power and Light Company appoints **W. S. Brokenshire, Jr.,** as assistant chief engineer, **B. C. Seitzinger** as superintendent of construction and **C. B. Huston** construction superintendent of the firm's engineering and construction department.

- **Honors**—Two Corps of Engineers officers, **Brig. Gen. Walter K. Wilson, Jr.,** and **Col. Gunnard W. Carlson,** have been awarded the Legion of Honor by the Republic of France. The honors were confered for services and cooperation given the French authorities during construction of the military bases in French Morocco.

- **Retirements—Burleigh R. Downey,** maintenance engineer for the Michigan State Highway Department after 50 years of engineering work, 26 of which have been with the highway department . . . **Marc C. Fosgate,** assistant district engineer for operations for District X of the California Division of Highways after 35 years.

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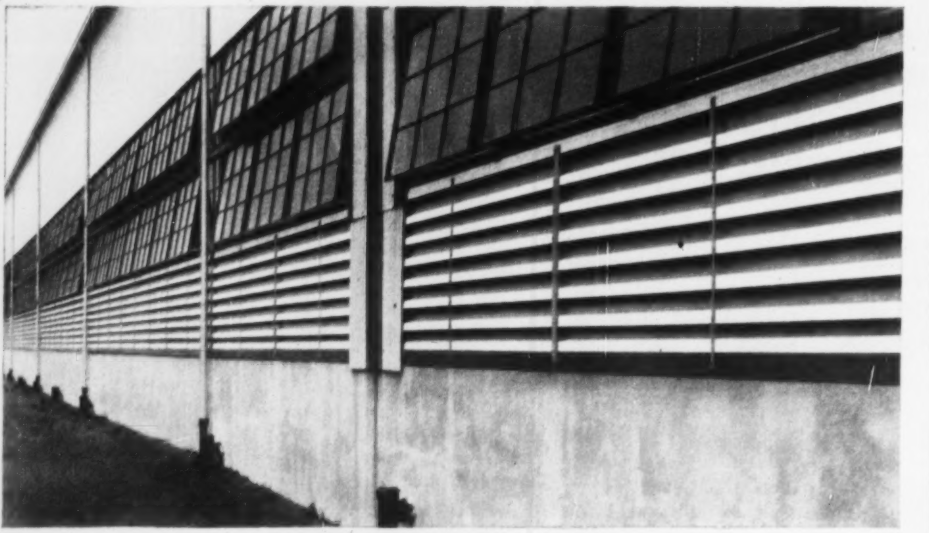

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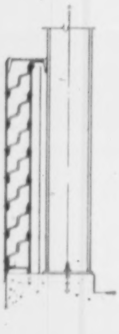

Sidewalls in this Alabama plant ventilate and protect at the same time. Louvers made of fireproof Gold Bond Corrugated ASBESTONE "400" form the lower sections of these unusual sidewalls and add to the general appearance of the plant, too. The diagram at the left illustrates the method used in this system. The upper walls are sided with Corrugated "400" in the traditional straight line method. Rock-like ASBESTONE needs no upkeep . . . resists weather and corrosion permanently.

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Obituaries

Lafayette A. Goldstone, 80, a pioneer in the design of cooperative and luxury apartment houses, died June 22 in New York City.

With William L. Rouse, his partner from 1909 to 1926, Mr. Goldstone won the Gold Medal of the New York Chapter of the American Institute of Architects for an apartment house design in 1914. One of his last projects was the Lillian Wald Houses in New York, designed in association with Frederick L. Ackerman and completed in 1947. It was the first joint project of the New York City Housing Authority and the New York State Division of Housing.

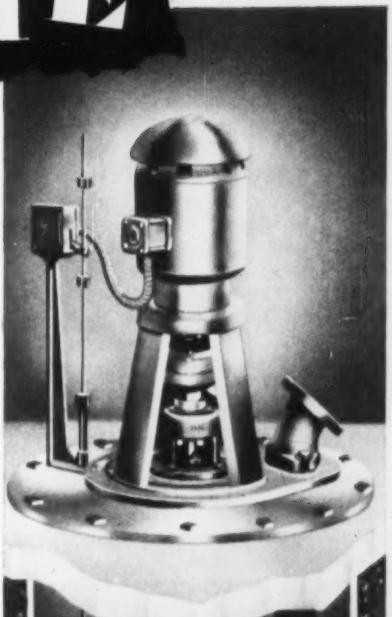
Born in Poughkeepsie, N. Y., on June 21, 1876, Mr. Goldstone left school before he was 14. Working at three office-boy jobs during the day, he took night lessons in drawing from a retired architect. At 15, he moved to New York City and began his intensive self-training through odd jobs with architects and builders. He began his own practice in 1902.

Mr. Goldstone volunteered at the outbreak of the Spanish-American War and served six years in the U. S. Naval Reserve. During World War I, he supervised the construction of shipworkers' villages along the east coast for the U. S. Shipping Board.

Norman D. Urquhart, 74, construction engineer for the South Carolina Electric and Gas Co., died last month following injuries sustained in a traffic accident. A native of Nova Scotia, he spent five years with the Colorado Power Co., during which time he was considered one of the youngest construction superintendents in the country. Mr. Urquhart also spent ten years in the Philippines working for Associated Gas and Electric Co. Returning to this country in 1938, as superintendent of gas operations for South Carolina Electric and Gas, he served as their chief construction engineer for ten years preceding his death.

Stephen M. Griffith, 75, whose construction firm, The Griffith Co., has a part in building Shasta and Friant dams, portions of the Colorado aqueduct and other major western water projects, died July 6 at Los Angeles.

Hardy S. Ferguson, 87, retired consulting engineer, died at Cape Elizabeth, Maine on July 6. Associated with the Great Northern Paper Company of Maine for many years, he was the designer of Ripogenus Dam.



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More Money

Federal fresh-from-salt water project gets boost

The federal government's program for developing processes to make fresh water from sea and brackish water has gotten a big boost from Congress.

Office of Saline Research funds for fiscal year 1957 have been upped to $750,000, an increase of $350,000 over the year just ended.

In justifying the need for additional funds, Department of Interior gave process-by-process status report on OSR research grant program:

Scale-Free Distillation—Distillation types and cycles have been proposed which, under scale-free conditions, may be able to produce water at about one-third to one-fifth the cost by existing equipment. To test scale prevention techniques for two new designs, it is necessary to construct and operate a portion of a full-scale plant.

Osmionic Cell Development—New York University has developed and tested this process successfully in the laboratory; next step is construction of operating cells.

Freezing Process—Types of refrigeration equipment other than conventional surface freezers and solid-liquid phase separation devices warrant additional consideration.

Vapor-Compression Distillation—The Hickman rotary vapor-compression distillation process has a great advantage in both power and equipment cost compared to present types.

Solar Stills—A solar distiller of radically new design is showing potential, justifying a model of considerably larger size than present experimental stills. Detailed designs are now being made. Investment costs per unit of water produced is expected to be greatly reduced.

Reverse Osmosis—University of Florida researchers have shown demineralization of saline water by this process holds considerable promise. Present films remove 90-95% of the salt in one pass but flow rate and durability of films have to be improved.

Electrodialysis—Practical use of the electrodialysis process has been developed recently.

At least one firm has put equipment on the market for producing fresh from brackish water. But the equipment is custom-built and costly.

STRUCTURAL CLAY PRODUCTS

New Center for Clay Research

Not scheduled for formal dedication until 1957, the new $500,000 research center of the Structural Clay Products Research Foundation is now in operation. In the center, a staff of 27 scientists and technicians will continue the industry's five-year-old research program.

The new building—of masonry construction—consists of two square-shaped sections placed side by side, thus giving it a shape symbolic of structural clay products. It was designed by Howard T. Fisher & Associates, Chicago, Ill., and is located on a 16-acre site just south of Geneva, Ill.

Research projects under way include work on lightweight clay products, mortar, facing tile, brick packaging, atomic blast resistance, thermal research, and preassembled clay masonry walls. Robert B. Taylor is director of the new center.

Longer Life

Flat-particle additive preferred for asphalt roofing

Mineral additives, such as mica, blue-black slate and oyster shell, can significantly prolong life of asphalt roofing, according to tests conducted at the National Bureau of Standards. The tests on weathering resistance of fine mineral additives revealed that such particles, having flat, plate-like shapes, are the most effective in increasing durability of asphalts. Silica, with almost cubic particles, was among the additives producing least increase in weathering resistance.

Tests included fourteen different mineral additives and three roofing asphalts (representing the three major U. S. types). They were performed in an "accelerated durability" machine, which consisted of a rotating drum in which specimens could be subjected to controlled conditions of heat, light and water spray.

Particle-size distribution was found to be important. Size distributions were evaluated for blue-black slate, dolomite, and silica. For durability, the distribution passing a 200-mesh sieve was found to be most effective; that between 60- and 200-mesh, least effective.

Durability was found to be a function of both asphalt and mineral additives, with the asphalt the more important of the two ingredients. "In all instances," cited the report, "durability increased with film thickness."

The researchers also exposed the three asphalts without additives, and learned that durabilities were inversely proportional to softening points. This difference was not significant when coatings contained mineral additives.

S. H. Greenfeld of the Asphalt Roofing Industry Bureau's Research Associateship conducted the study.

Ultimate-Strength

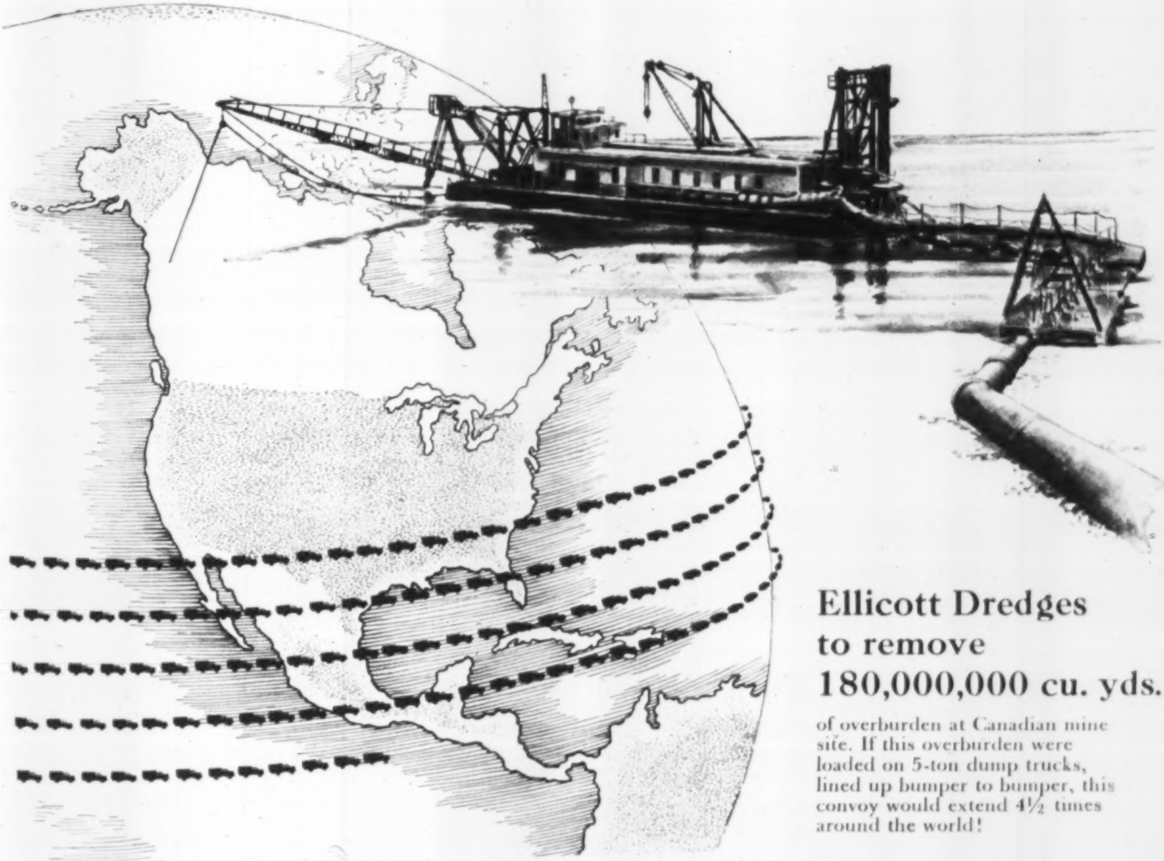
London conference hears new prediction theories

In parallel with current engineering thought in the U. S., British and Continental engineers were preoccupied with ultimate-strength design at the Symposium on the Strength of Concrete Structures, held in London, May 16 to 18. Most papers delivered at the gathering, sponsored jointly by the Cement and Concrete Association and the Joint Committee on Concrete, dealt directly with ultimate-strength design and the proposed revisions of that method in the British Standard Code of Practice.

American contributions included a discussion by Eivind Hognestad, of the Portland Cement Association, on the 10-year study of ultimate-strength design procedures by a joint committee of the American Society of Civil Engineers and the American Concrete Institute.

M. R. Horne, of Cambridge University, pointed out the difficulty of closely defining correct design loads. He proposed the theory of probability as a research tool that might eliminate personal factors in deriving design loads.

Arne I. Johnson, a Swedish engineer, proposed a method of design



Ellicott Dredges to remove 180,000,000 cu. yds.

of overburden at Canadian mine site. If this overburden were loaded on 5-ton dump trucks, lined up bumper to bumper, this convoy would extend 4½ times around the world!

Steep Rock Lake–greatest dredging job ever undertaken!

By 1969, the Falls Bay Area of Steep Rock Lake, Ontario, will be yielding 3,000,000 gross tons of high grade iron ore a year. But before Caland Ore Co., Ltd., Canadian subsidiary of Inland Steel Company, can begin mining operations, approximately 180,000,000 cu. yds. of silt and overburden must be removed to expose the ore. This tremendous task—greatest dredging job ever undertaken—is being accomplished by two Ellicott-designed dredges.*

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in which the probability and cost of failure are definite mathematical factors in selection of a safety factor. Johnson's method, which he called statistico-economic, also extended statistical considerations to variations in actual strength of materials and true structural dimensions (effective slab depth, for instance). He reported that use of statistico-economic design had enabled him to reduce the slab-reinforcing steel by 30% in an 800,000-sq-ft Stockholm residential project.

A. J. Harris, British consulting engineer, described a new theory of concrete rupture based on cohesion and the angle of internal friction, concepts applied mainly in soil mechanics.

An account of combined bending and torsion studies, in both reinforced and prestressed concrete, was delivered by Stewart Armstrong, of the University of Bristol. Although torsion is seldom of prime importance in civil engineering structures, Armstrong declared, it is always present and cannot be ignored when ultimate-strength design methods are used.

Tests results on moment redistribution in continuous beams were reported by K. Hajnal-Konyi, consulting engineer, London, and H. E. Lewis, of the Cement and Concrete Association. Measuring the effects of three variables — concrete strength, steel strength and percentage of reinforcement—Hajnal and Lewis found that redistribution of moment took place in all the tests and that high-tensile-strength steel reinforcement raised the ultimate load of all beams, including over-reinforced specimens.

Y. Guyon, a French engineer, concluded in his paper on the strength of statistically indeterminate prestressed concrete structures at our present state of knowledge, ultimate-strength designs should be checked by elastic calculations.

Ultimate strength of continuous beams and simple plane frames of prestressed concrete were analyzed by P. B. Morice and H. E. Lewis, both of the CCA. First demonstrating that linear tendon transformations have no effect on the elastic-range stresses of a statistically indeterminate prestressed concrete structure, they proceeded to show that the same is true theoretically for ultimate loads when the structure fails in tension. (A linear transformation is a continuous tendon profile in a continuous beam that consists of straight lines between supports, with no eccentricity at simple supports.)

A. E. Seddon, of the Building Research Station, reviewed information on the strength and behavior of monolithic concrete walls under axial and eccentric loads. He observed greater strength in walls with height-length ratios below about 1.5.

S. C. C. Bate, also of the Building Research Station, noted that failure of concrete members under repeated loading depends primarily on steel performance. Also, transverse reinforcement plays an important role in developing impact resistance in both reinforced and prestressed concrete.

A method for ultimate-strength analysis of skew bridge slabs was given by P. B. Morice and G. C. Reynolds, of the CCA. They reported reasonable agreement between experimental and analytical determinations for a number of small-scale models.

D. D. Matthews, of Matthews & Mumby, Ltd., noted that under the proposed British code revisions on utilmate-strength design, different load factors would be assigned to the steel and concrete in a single member; while under the new ACI code (ENR Mar. 1, p. 26), one factor would apply to the member as a whole. Matthews explanation of the difference is that the British stipulation would apply to all grades of concrete while the ACI code provisions are restricted to "controlled" concrete.

Three-Year Study Indicates Atomic Wastes Harm Fishlife

Discharge of radioactive wastes into natural waters produces marked injurious effects upon fish. This is the conclusion reached after a three-year study initiated by AEC and the TVA. The work was done under the direction of Louis A. Krumholz of the American Museum of Natural history.

The damage done by discharging a partially treated effluent into Tennessee's White Oak Lake was not hard to find. Assimilation of radioactive strontium, which enters bone tissues the same way calcium does, caused a build-up of radioactivity in the species of fish that survived long enough to show a trend. The study indicated that for certain species, the accumulated strontium ranged from 20,000 to 30,000 times that of the lake water in which they lived.

What did this build-up of radioactivity mean to the fish? Two species, the white crappie and the redhorse, are all but extinct after the three-year bout with radioisotopes. Life spans of the others were shortened as well, and a decreased rate of growth was observed.

White Oak Lake was made a restricted area for the studies.

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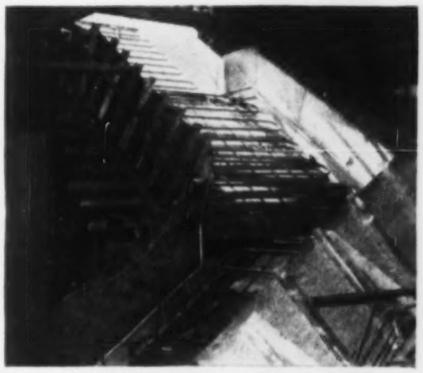

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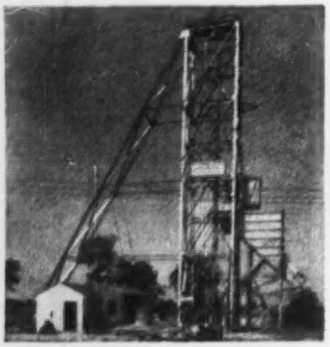

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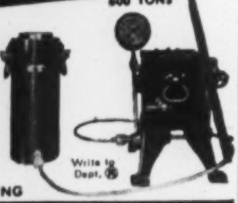

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Legal

A Contractor Is Bound By Mistake in His Bid

A mistake in a bid caused by negligence is ordinarily no justification for repudiating the contract.

In a case that came before a federal court in Ohio, a contractor who slipped up on his bidding was held to the terms of his contract. This was the background:

A prime contractor for the erection of a bridge asked another contractor to submit a bid for the manufacture of bridge transoms in accordance with certain specifications furnished by the prime contractor. The agent or representative of the subcontractor submitted a bid of $70.50 per unit and thereafter the prime contractor sent three orders covering all the transoms needed for the job.

The subcontractor refused to furnish the transoms, claiming that in the preparation of the bid he had made an erroneous assumption as to the size of the transoms. The prime contractor then had the transoms made by his own men at a cost of $95.70 per transom, brought an action against the subcontractor to recover the increased costs and obtained a recovery.[1]

The subcontractor had three defenses: (1) No valid contract existed between the parties. (2) The person who negotiated the tranaction for the subcontractor was not its authorized agent. (3) There was an excusable mistake in computing the price of $70.50 for each transom which justified the subcontractor's repudiation of the contract.

The court held that since the subcontractor had made a definite offer and the same had been accepted by the prime contractor, a valid contract existed. The court also found that the evidence produced at the trial indicated that the subcontractor by his acts had ratified the transaction.

The prime contractor, in preparing his bid, had estimated the cost of the transoms at $70.00 each and, as the bid submitted by the subcontractor was $70.50 each, there was nothing in the bid submitted by the subcontractor to cause the prime contractor to suspect that the subcontractor had made a mistake in his bid. According to the court, the mistake in the bid was the result of the negligent manner in which it was prepared and not the result of an excusable mistake.

In referring to many cases cited in the brief submitted by the attorney for the subcontractor to support his contention that under the circumstances involved in the case the subcontractor had the right to repudiate the contract, the court stated: "In analyzing these cases, we find that all of them, with but one exception, are cases wherein the plaintiff is bringing a suit in equity for the rescission of a contract and where the Courts have concluded, from the facts, that rescission was in order because it was possible to restore the defendant to a position of status quo without injury or damage to the defendant because of the mistake made by plaintiff in making its quotation. We do not here have an equity case in which the remedy of rescision is prayed for. We have a case at law in which damages are sought for the breach and repudiation of a contract, and in which it would not be possible to restore the parties to a position of status quo. Plaintiff appears to have done everything within its power to carry out the terms of the contract. It has suffered injury because of the repudiation of the contract. We believe that it is entitled to an order adjudging that defendant violated the contract as pleaded in the amended complaint."[1]

---

(1) Utica Structural Steel, Inc. v. Donovan Wire & Iron Co., 134 F. Supp. 837; U. S. District Court of Ohio, Sept. 30, 1955.

Court Outlines the Law On Liquidated Damages

Most construction contracts contain a provision to the effect that in the event the contractor fails to complete the work at the stipulated time, a certain amount will be deducted from the contract price for each day of delayed performance. This is known as liquidated damages. Such contract provision usually will be enforced unless the amount is excessively disproportionate to the actual damages sustained. In the latter case, the amount deducted for delayed performance is considered a penalty rather than damages and is not enforceable.

In a recent case[1] where this matter was involved, the court said: "When are liquidated damage provisions enforceable and when are they construed as penalties? The cases on this question do not enunciate an absolutely consistent formula. The Supreme Court has recently said, in Priebe & Sons v. United States, 332 U. S. 407, 68 S. Ct. 123, 92 L. Ed. 32, that such provisions are enforced when they are fair and reasonable attempts to fix just compensation for anticipated loss caused by breach of contract. The Court also noted that such provisions are particularly useful when damages are uncertain in nature or amount or unmeasurable. It may be added that there was no element of actual damage in the Priebe case. We quote from the opinion in Wise v. United States, 249 U. S. 361,365, 39 S. Ct. 303,304, 63 L. Ed. 647, in which the Court in discussing a liquidated damages provision uses the following language:

"'When that intention is clearly ascertainable from the writing, effect will be given to the provision, as freely as to any other, where the damages are uncertain in nature or amount or are difficult of ascertainment or where the amount stipulated for is not so extravagant, or disproportionate to the amount of property loss, as to show that compensation was not the object aimed at or as to imply fraud, mistake, circumvention or oppression. There is no sound reason why persons competent and free to contract may not agree upon this subject as fully as upon any other, or why their agreement, when fairly and understandingly entered into with a view to just compensation for the anticipated loss, should not be enforced.'

"It has also been held that where there is an excessive disproportion between the actual and stipulated damages, the stipulated damages will be construed as a penalty. Kothe v. R. C. Taylor Trust, 280 U. S. 224,226, 50 S. Ct. 142, 74 L. Ed. 382. And these tests are to be applied not as of the time of the breach, but as of the time of making the contract. Priebe & Sons v. United States, supra, 332 U. S. at page 412, 68 S. Ct. at page 126."

(1) Hughes Bros. v. United States, 134 F. Supp. 471, U. S. Court of Claims, Oct. 4, 1955.

Finality of Determinations By Architects or Engineers

Building and construction contracts frequently provide that the approval, or estimate, or decision of an architect, engineer, superintendent or other person shall be conclusive and must be obtained before a contractor acquires a right to receive payment for work he has done.

In discussing this problem, the Court of Common Pleas of Ohio referred to 11 Ohio Jur., 2d Contracts, Sec. 224, page 480 and said: "Contracts which provide for the acceptance of a building by an architect and that his determination shall be final are lawful and are usually upheld."[1]

The court further stated: "It is true as cited in Merrill-Ruckgaber Co. v. United States, 241 U. S. 387, 36 S. Ct. 662, 60 L. Ed. 1058: 'Parties to a contract may agree to submit differences of views in the interpretation of drawings and specifications to the decision of an architect or engineer, and the validity of such an agreement is unquestionable, in the absence of bad faith, fraud or a failure to exercise an honest judgment.'

"See also Reaugh Const. Co. v. Corlett, 23 Ohio, N. P., N. S., 336; Fred R. Jones Co. v. Faith, 101 Ohio St. 47, 126 N. E. 878; also 12 Am. Jur. p. 898 and 899 to the effect that bad faith, fraud, or a failure to exercise an honest judgment may give a contractor a right to recover * * *."

(1) Geis Const. Co. v. Board of Education, 121 N.E. 2d 878, Court of Common Pleas of Ohio, Sept. 22, 1955.

Licensing of Contractors Applies to All Partners

In some states, like California, local statutes require persons engaged in the contracting business to be licensed.

Recently, the question arose as to whether it was sufficient, in the case of a firm of contractors, for only one of the partners to be licensed. The court held that licensing of only one member of the firm was not sufficient, and denied recovery for work done.[1]

The court stated: "The courts have held that a partnership which furnishes labor and materials as a contractor is required to have a license as a 'person' under the provisions of Section 7025 of the Business and Professions Code. Likewise it is settled that such a partnership cannot recover for services rendered where it fails to allege and prove that it was a duly licensed contractor at all times during the time of the performance of the acts or contract for which a recovery is sought pursuant to the provisions of the Business and Professions Code as set forth above.

"Also it is well settled that the foregoing requirement is not satisfied by the issuance of a license to one of the partners. (Kirman v. Borzage, 65 Cal. App. 2d 156, 150 P. 2d 3)."

(1) Flickinger v. Swedlow Engineering Co., 284 P. 2d 521, Court of Appeals of California, May 25, 1955.

(These summaries of court decisions are prepared by I. Vernon Werbin, New York attorney and civil engineer.)

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Concrete Roads Design and Construction—By Road Research Laboratory D.S.I.R. 404 pp. H. M. Stationery Office, York House, Kingsway, London, W.C. 2.

Over a number of years the Road Research Laboratory of Britain has been examining existing roads, observing the behavior of experimental roads, studying failures, and carrying out laboratory investigations. As a result, a new assessment of the principles of design and the techniques employed in concrete road construction has been made. This book, a followup to *Soil Mechanics for Road Engineers* represents a compilation of the theoretical and practical information gathered by this group. It contains detailed observations on major aspects of road construction and lays particular stress on those factors necessary to insure a road of good riding quality.

The book is divided into three sections. Part I concerns itself with the properties of cement, aggregates, water, admixtures, and the effect of these properties on those of concrete. Testing methods and design of a mix which will achieve economy of cement without hindering workability or strength of concrete, is fully described. Uniformity of concrete and ways to insure its durability, particularly in relation to effects of frost, are also discussed.

The basic principles underlying design of concrete road slabs and joints, as well as several new recommendations based on practical experience, are dealt with in Section II. Stresses in slabs, use of prestressed concrete, amount and type of reinforcement needed under varying conditions, factors governing slab dimensions, and design and construction of joints are among the topics included. Of particular interest is a chapter which delves into causes of defects and methods of avoiding deterioration of roads.

Part III describes types of machines used in constructing concrete road slabs—efficiency and performance of mixers, compaction of concrete by vibration, the necessity of controlling materials, and means to control quality of paving laid by mechanical methods. Also included are descriptions of tests and field trials carried out on mixers and compacting machines.

The material offered in this book is thoroughly, yet succinctly presented; it is well supplemented by photos, graphs, and charts and contains ample detailed information. This text should prove of value to those directly concerned with—or interested in—the design and construction of concrete roads.

Air-Conditioning Manual

Trane Air Conditioning Manual—By The Trane Company, 380 pp. Jones and Kroeger Company, Winona, Minn. $5.

The new edition of this comprehensive air-conditioning manual has been brought up to date with new terminology, tables and illustrations. However, practical application of engineering fundamentals to the design of air-conditioning systems remains its primary concern.

Factors and conditions that must be considered for proper design are explored in detail; these include the best atmospheric conditions for comfort, properties of air and the calculation of heat gain through structural materials and members. Refrigerating systems, use of water for air conditioning, proper design of duct work and characteristics of fans are also discussed.

The outstanding feature of this book is its extensive section of reference tables and charts; such material is convenient for making calculations and shows clearly the effect of changing various factors—tables that show overall coefficients of different types of wood and masonry construction, design temperatures for specific cities (to be used in calculating cooling load), mean temperature differences, and air flow in ducts.

Along with the text, The Trane Company offers a loose package of cooling and heating-load estimate sheets and psychometric charts; the latter can be used to trace changes occurring in humid air subjected to various air-conditioning processes.

Prefabricated Concrete

Precast Concrete—By Kurt Billig. 341 pp. D. Van Nostrand Co., Inc., New York, N. Y. $7.50.

The science of precasting concrete units and assembling them into structures, as practiced abroad, is summarized in excellent fashion in this book.

The text is divided into four parts. The first deals with fundamentals: design methods, production processes, prestressing, transportation and erection. The second part discusses precast units for floors, roofs, walls, columns, railroad ties, piles, poles, slabs and composite members. The third part covers methods of joining precast units. And the last part surveys precast structures erected abroad.

In his handling of the subject, the author appears to approach precasting more from the designer's viewpoint than the builder's. Treatment of formwork and methods of handling, storing and erection, as well as of field work, is much too brief. On the other hand, the discussion of types of units and shapes being used is more comprehensive. The author also does well in pointing out the importance of achieving "proper balance in the structure between precast units and in situ concrete."

Miscellaneous Notes . . .

• **Hydraulics research**—Two reports of interest to hydraulic designers have been announced as available by The Waterways Experiment Station of the Corps of Engineers, Vicksburg, Miss. Techincal Memorandum No. 2-431, entitled "Outlet Works and Spillway for Garrison Dam, Missouri River, North Dakota" is available at $1.50 per copy. The report describes model investigations concerned with hydraulic performance of the spillway as well as flood control and power tunnels. Miscellaneous Paper No. 2-154 entitled "Cavitation at Baffle Piers" is available at 50¢ a copy. It describes effects of various shapes of baffle piers on the formation and location of cavitation flashes. Ten different baffle-pier shapes were tested in a variable-pressure, closed-jet water tunnel.

• **Disaster planning** — Procedures for restoring water and sewerage utilities following enemy attack are suggested in a 24-page booklet, "Emergency and Disaster Planning for the Water and Sewerage Utilities", published by the U. S. Department of Commerce. The material was prepared by a task group consisting of G. E. Arnold, D. V. Auld, E. S. Chase, L. R. Howson, W. R. LaDue, S. B. Nelson, N. T. Veatch, W. V. Weir, H. E. Jordan and the late T. A. Berrigan.

• **Bridge design**—A 32 page booklet containing discussion notes, photographs and structural detail drawings relating to highway and railway bridges with simple and continuous spans has been prepared by A. A. Eremin, associate bridge engineer, California State Division of Highways. Available from the author, 1541 37th St., Sacramento, 16, Calif. $4 p.p.

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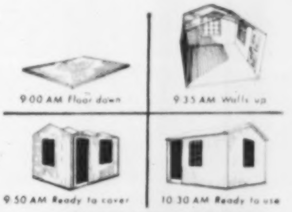

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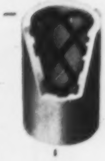

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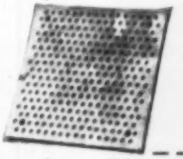

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West Virginia Interceptor Storm Sewer

Reinforced concrete pipe wins contract in three way pricing, beats less expensive corrugated metal pipe

Bids on two and three alternates on the pipe and prices by depth of trench as well as by size of pipe feature this $1.3 million interceptor storm sewer for the Sanitary Board of the City of South Charleston, West Virginia. Howard K. Bell, Lexington, Kentucky, is consulting engineer.

For example, trench excavation at $65.15 per lin ft for 96-in. pipe to 20-ft depth ranges down to $3.30 for 8-10-in. pipe to a depth of 4 ft.

The total line is 19,272 lin-ft, all in trench except for 1,864 ft of 96-in., 72-in. and 60-in. pipe in tunnel.

The three alternate bids are for this tunnel section, reinforced concrete culvert vs corrugated metal pipe vs reinforced concrete "Tunneliner" pipe.

On the two-way alternate for trench-laid pipe reinforced concrete culvert pipe took the contract on a 3.025% higher price than the low bid on corrugated metal pipe. The low bid on the "Tunneliner" option was 3.5% above contract price.

Test borings for the tunnel show groundwater near Kanawha River. Inland from the river, however, borings for the tunnel were dry.

The contract price bid by Mountain State Construction Company of Spring Hill, W. Va., was 4.8% above the engineers' estimate and only 0.05% below the second low bid on the reinforced concrete alternate. The engineers' estimate gives the same price for all three alternates.

In addition to pipe, manholes, transition structures and fittings this contract calls for extra rock excavation, 2,433 cu yds in trench and 5 cu yds in tunnel, and for an asphaltic concrete pavement with 1,120 lin ft of combined concrete curb and gutter for a total of $79,513.

Prevailing wage rates are $2.25 to $3.40 for skilled labor, $2.10 to $2.75 for semi-skilled, $2.00 for unskilled.

Together with a similar smaller job this project will provide adequate surface drainage and will unload sanitary sewers to which surface drainage is now connected.

This smaller job, 9,238 lin ft sewer in trench and 255 lin ft in tunnel, drew a $536,334 low bid on the alternate for reinforced concrete pipe.

Bidders include:

1C	Mountain State Const. Co., Spring Hill, W. Va	$1,300,785
2	Moyer Bros., Charleston, W. Va	1,301,466
6	Peter Kiewit Sons, Condon-Cunningham, Omaha, Neb	1,819,511
EE	Howard K. Bell, Consulting Engineers, Lexington 45, Ky	1,241,449

Bids: 5-9-56		Quan-	Unit Prices	
Items	Unit	tity	1C	2
Excav & bkfl, trench for				
sewer, 96", 18-20′	lf	415	$65.15	$90.00
14-16′	lf	787	45.82	73.00
12-14′	lf	580	37.49	60.00
72", 10-12′	lf	727	24.27	45.00
54 or 60", 14-16′	lf	37	32.59	55.00
12-14′	lf	1,076	26.71	44.00
10-12′	lf	392	21.33	36.00
6-8′	lf	181	12.47	20.00
42 or 48", 18-20′	lf	84	39.52	80.00
8-10′	lf	377	14.33	25.00
6-8′	lf	258	10.78	15.00
30, 33, or 36", 12-14′	lf	592	18.76	38.00
10-12′	lf	350	14.97	28.00
8-10′	lf	997	11.68	18.00
6-8′	lf	470	8.85	15.00
4-6′	lf	386	5.75	4.00
0-4′	lf	61	4.95	3.00
21, 24, or 27", 14-16′	lf	40	17.18	55.00
8-10′	lf	121	8.95	18.00
6-8′	lf	1,942	6.82	12.00
4-6′	lf	2,163	4.48	4.00
0-4′	lf	56	3.92	3.00
10, 12, 15 or 18", 8-10′	lf	48	7.28	15.00
6-8′	lf	282	5.67	12.00
4-6′	lf	3,000	3.74	4.00
0-4′	lf	1,740	3.30	3.00
Sewers in trench				
RCP culv, std str, 96"	lf	415	64.20	82.00
60"	lf	37	31.99	36.00
36"	lf	32	13.82	15.00
extr str, 42"	lf	84	52.23	20.00
RCP, 96"	lf	1,367	62.00	80.00
72"	lf	727	50.00	46.00
60"	lf	1,091	31.00	36.00
54"	lf	558	25.70	29.00
48"	lf	632	21.59	23.00
42"	lf	3	18.90	20.00
36"	lf	1,912	13.42	14.00
33"	lf	607	11.85	13.00
30"	lf	308	9.93	11.00
27"	lf	1,337	8.75	5.00
24"	lf	1,009	7.61	7.00
RCP culv, std str, 21"	lf	40	7.20	7.00
RCP, 21"	lf	1,938	7.00	6.75
18"	lf	1,111	5.70	4.50
15"	lf	1,069	4.56	3.50
12"	lf	1,419	3.83	2.50
plain conc or VCP, 10"	lf	1,415	2.92	2.00
8"	lf	50	2.26	1.55
6"	lf	100	1.82	1.25
4"	lf	150	1.31	1.00
Alternate for CMP				
96", 8 gage, shop strutted	lf	415	67.00	77.00
60", 10 gage, shop strutted	lf	37	32.00	33.00
36", 14 gage	lf	32	14.00	13.00
42", 12 gage	lf	84	52.23	19.00
96", 8 gage	lf	1,367	67.00	77.00
72", 10 gage, shop strutt	lf	727	50.00	42.00
60", 10 gage	lf	1,091	32.00	33.00
54", 12 gage	lf	558	26.00	25.00
48", 12 gage	lf	632	23.00	23.00
42", 14 gage	lf	3	20.00	19.00
36", 14 gage	lf	1,912	14.00	13.00
Sewers in tunnel				
RCP culv, extr str, 96"	lf	1,709	250.00	200.00
std str, 72"	lf	75	185.00	160.00
60"	lf	80	165.00	140.00
Alternate for CMP				
96", 8 gage	lf	1,709	231.00	190.00
72", 10 gage	lf	75	185.00	125.00
60", 10 gage	lf	80	165.00	110.00
Alternate for RCP "Tunneliner"				
96"	lf	1,709		225.00
72"	lf	75		175.00
60"	lf	80		450.00
Manholes in place				
dia 4′ to 11′ dp, for P, 96"	ea	3	1,755	600.00
to 9′ dp, for p, 72"	ea	1	1,240	500.00
to 8′ dp, for P, 60"	ea	3	1,060	475.00
to 7′ dp, for P, 48 or 54"	ea	4	930.00	350.00
to 5′ dp, for P, 12-30"	ea	25	480.00	250.00
dia 5′, to 6′ dp, for P, 33-42"	ea	12	645.00	400.00
Extr barrel, dia 4′, 5-12′ dp	lf	26	54.00	60.00
Ex barrel, dia 4′, 12′-20′ dp	lf	21	87.00	70.00
over 20′ dp	lf	2	87.00	100.00
dia 5′, 6-12′ dp	lf	23	67.00	65.00
12-20′ dp	lf	5	105.00	75.00
Manhole drops & vert stacks				
MH drop, dia 36"	lf	8	114.00	40.00
30"	lf	6	98.00	35.00
27"	lf	25	86.00	33.00
24"	lf	9	78.00	32.00
21"	lf	8	68.00	31.00
18"	lf	16	64.00	30.00
15"	lf	12	54.00	28.00
Vert stacks, dia 15"	lf	11	75.00	15.00
12"	lf	71	55.00	14.00
Transition structures				
Outlet struct	ea	1	4,390	1,900
Headwall	ea	1	375.00	250.00
Curve, 96", & junction, 42"	ea	1	7,060	6,900
Junction, 96", 60", 54"	ea	1	8,226	5,550
72" & 42"	ea	1	7,173	3,550
Curve, 60"	ea	1	6,303	3,200
Inlet struct	ea	1	890.00	1,500
type I, outlet pipe 15"	ea	7	610.00	650.00
IA, outlet pipe 15"	ea	5	665.00	700.00
I, outlet pipe 12"	ea	28	550.00	600.00
II, outlet pipe 15"	ea	3	740.00	650.00
II, outlet pipe 12"	ea	3	456.00	600.00
III, outlet pipe 15"	ea	8	495.00	400.00
III, outlet pipe 12"	ea	3	360.00	300.00
IV, outlet pipe 18"	ea	2	3,496	2,900
Connection to exist CB	ea	79	150.00	70.00
MH	ea	2	200.00	70.00
storm drain	ea	61	150.00	70.00
junc box & cover	ea	1	250.00	120.00
Pipe fittings, in place				
Y or T, 36"	ea	2	100.00	112.00
30"	ea	2	76.00	84.00
24"	ea	4	52.00	58.00
21"	ea	4	50.00	57.00
18"	ea	10	33.00	37.00
15"	ea	13	26.00	28.00
12"	ea	20	22.00	24.00
10"	ea	3	11.00	12.00
8"	ea	4	8.00	9.00
6"	ea	8	5.50	6.00
4"	ea	12	4.00	4.50
Elbow or curve, 30"	ea	1	76.00	84.00
21"	ea	1	50.00	57.00
18"	ea	10	33.00	37.00
15"	ea	42	26.00	28.00
12"	ea	81	22.00	24.00
10"	ea	81	11.00	12.00
8"	ea	8	8.00	9.00
6"	ea	16	5.50	6.00
4"	ea	24	4.00	4.50
Increaser, 15"	ea	7	26.00	28.00
12"	ea	6	23.00	24.00
10"	ea	6	11.00	12.00
8"	ea	1	8.00	9.00
Slant or saddle, 21"	ea	1	24.00	57.00
18"	ea	3	16.00	37.00
15"	ea	13	13.50	28.00
12"	ea	16	10.70	24.00
10"	ea	17	5.40	12.00
8"	ea	4	4.00	9.00
6"	ea	8	4.00	6.00
4"	ea	12	4.00	4.50
Plug, 21"	ea	1	8.00	40.00
18"	ea	1	6.70	35.00
15"	ea	1	5.40	30.00
12"	ea	6	4.00	25.00
10"	ea	1	2.80	20.00
Pipe underdrain in place, 8"	lf	400	4.13	3.00
6"	lf	400	3.93	2.00
Excav, solid rock, in trench	cy	2,433	8.00	15.00
in tunnel	cy	5	25.00	35.00
Pipe bedding, in place	t	532	10.00	6.00
on surf	t	1,500	9.00	6.00
Cinders, in place, on surf	t	35	8.00	4.00
Sheets & shore, in place	Mfbm	80	100.00	120.00
Load bearing piles, 10" dia	lf	600	10.00	6.00
Earth, pre-solidific, 96" sew	lf	50	50.00	100.00
Conc, cl A	cy	40	125.00	60.00
cl E	cy	80	60.00	50.00
Steel, reinf	lb	2,000	0.18	0.20
Forms	sf	2,500	1.25	0.40
Cement for grout	bbl	23	50.00	50.00
Excav, earth	cy	60	6.50	6.00
Res engrs office	ls	job	2,500	2,500
Paving replacement				
Pave, conc, streets, 7"	sy	580	7.00	8.00
drives, SW, parking, 4"	sy	475	5.00	6.00
Base crse, conc, streets, 7"	sy	1,724	6.00	2.00
Add conc, slab thickn per 1"	sy	20	2.00	1.50
Surf crse, AC, 2"	sy	4,608	3.00	2.50
1"	sy	3,256	2.50	1.75
Curb & gutt, comb, conc	lf	1,120	3.00	8.00
Curb, conc	lf	856	1.60	4.00

Alt total, CMP	1C: $1,279,579	2: $1,262,588
RCP "Tunneliner"	1C: no bid	2: 1,346,116

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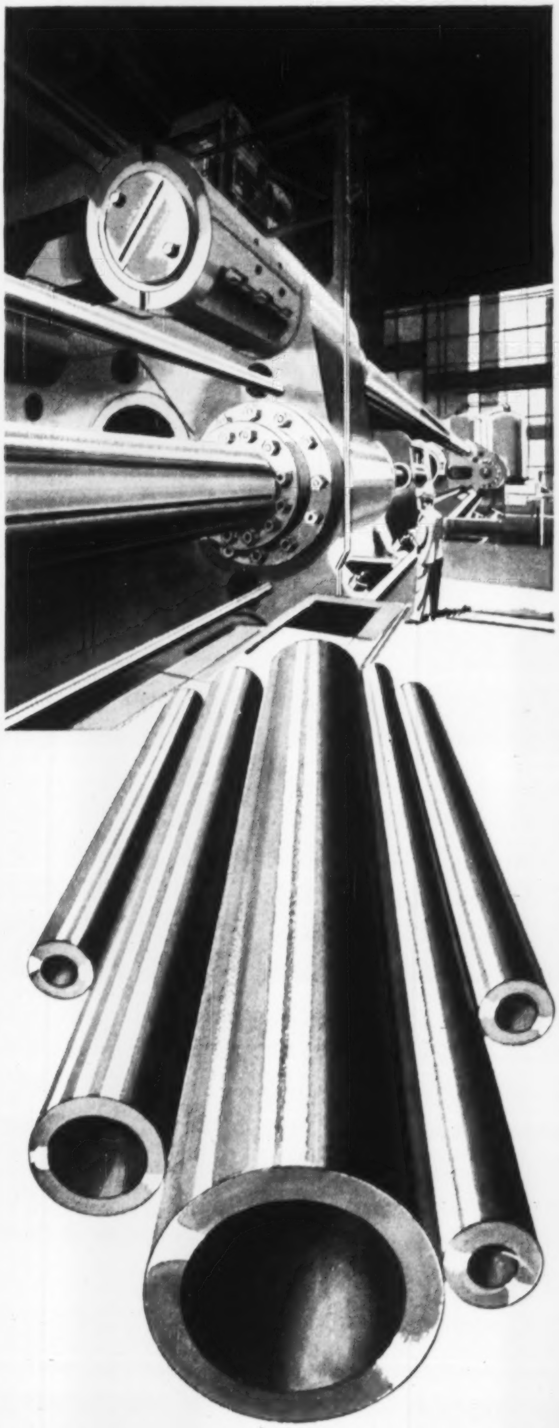

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- Aug 9—Cement, Aggregate, Ready-mixed Concrete, Asphalt
- Aug 16—Iron and Steel Products, Pipe
- Aug 23—Wood Products, Glass, Explosives, Chemicals

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Atlanta	$148.25p	$148.25p	$296.50p	$333.55p	......	......	$30.50p	$20.70p	$23.50	$24.50	$.....
Baltimore	202.00	216.00	405.00	485.50	596.00	681.00	36.00k	41.00k	33.00	22.00	.....
Birmingham	135.00p	152.00p		303.00p	376.00p	465.00p	27.00ff	38.00gg	33.35	22.30	26.33
Boston	210.60†	224.60†	421.10†	467.80†	......	......	40.00p	44.00p	35.20†	30.00†	.....
Chicago	135.00	145.00	280.00	......	......	......	30.00	32.00	36.00	29.00	.....
Cincinnati	205.00j	225.00j	296.00jdd	213.00j	288.00j	314.00j	45.00j	46.00j	28.50j	24.25i	28.50j
Cleveland	195.00**	207.00**	......	......	......	......	40.00	42.00	29.75	24.75	.....
Dallas	......	152.00	......	......	......	......	25.75	45.00	32.00	31.00	.....
Denver	......	......	......	......	......	......	36.00	47.50	34.80bb	28.00bb	34.00bb
Detroit	213.00	226.00	425.00	......	620.00	710.00	44.50cc	44.00cc	34.00	30.00	.....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	29.25	29.25	32.00	27.50	28.50
Los Angeles	r	r	r	r	r	r	30.50§	.....	34.00	34.00	35.00
Minneapolis	188.00p	210.00p	429.00p	210.00pw	......	......	43.00*p	52.50ii	44.50bbe	35.50bbe	47.50bbde
Montreal	164.00aq	178.00au	325.00au	270.00	288.00	......	42.00	49.00	39.20	22.00	13.75u
New Orleans	186.00	186.00	380.00	380.00	......	......	40.00	55.00	30.60	21.50	21.50
New York	158.10h	168.60h	231.70ch	255.20hn	......	......	44.00	.....	37.00	35.00	.....
Philadelphia	156.30	166.80	312.70	375.20	......	......	30/34	34/40	27.60	25.60	3.17
Pittsburgh	154.00	162.00	292.00	340.00	420.00	495.00	36.00	46.00y	32.00	29.50	2.97m
St. Louis	178.50cc	203.00cc	358.00cc	500.00cc	450.00cc	621.50	43.00sl	41.50s	.95saa	.80saa	1.30aaepee
San Francisco	156.85a*	177.10a*	235.30dda*	......	......	......	39.50*	39.50*	27.75	27.75	30.50
Seattle	225.00cc	250.00cc	350.00cc	250.00ccw	......	......	43.00s	55.00s	48.00shh	38.25hh	3.90mhh
Toronto	138.70	148.90	273.75	222.00f	......	......	41.50	63.00	40.00	33.50	31.00

*† F.o.b. yard Roxbury. *a Smooth. *b Per 50 lb. bags. *c 6 x 12 x 12 in.-3 cell. *d Pulverized hot. *e 5%, 10th following month. *f 8 x 8 x 12. *g 5½ x 8 x 12. *h F.o.b. trucks, job site N.Y.C. *j Truck load or over. *k $1.00 discount. *l Red face. *m Per bbl., 180 lb. *n 7¾ x 7¾ x 12. Speed tile. *p Truck lots. *q Provincial and Municipal tax extra. *r Not used because of earthquake danger. *s 2% discount for cash. *t 5½ x 8 x 11¼. *u Tax exempt. *v Sand lime. *w 5 x 8 x 12. *y Stacked. *z Pebble lime price per 80 lb. sack. *aa Price per sack. Lime not sold per ton. *bb LCL. *cc Truck delivery. *dd 8 x 12 x 12. *ee Pebble lime. *ff 80% common. *gg Rough. $40.00 Smooth. *hh lcl. *ii Chi common § F.o.b. yard *** Warehouse delivery. ** F.o.b. plant Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

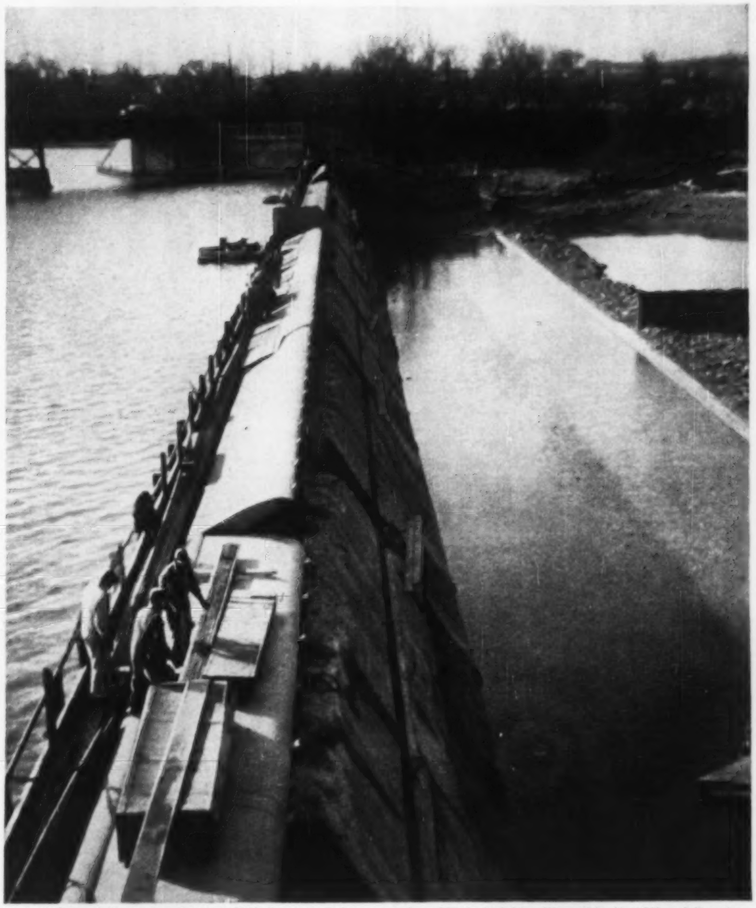
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry a	WHITE LEAD Per 100 lb. in 100 lb. cases in oil w	READY-MIXED PAINT Per gal., drums Graphite b	Aluminum c	Ferric Oxide d	ROOFING SUPPLIES: Carload lots f.o.b. factory Rolls, slate surfaced, 85-90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 380 lb. bbl. per ton
Atlanta	$19.25	$28.275	$3.59	$3.86	$3.31	$3.15	$2.95	$2.95	$0.63	$57.75
Baltimore	19.00	27.90	2.75	4.25	3.35	2.78	4.25	4.25	.48	50.18
Birmingham	19.25	28.275	3.90	3.40	....	3.00	2.55	2.63	.75ff	33.50ee
Boston	19.00	27.90	....	....	....	3.24gq	2.75og	2.75og	.45g	54.00g
Chicago	19.00	27.90	....	....	....	3.57‡u	2.95‡o	2.95‡o	43.50‡bbr	52.70‡
Cincinnati	19.00	27.90	....	....	....	3.15	2.63	2.63	.594y	50.38
Cleveland	19.00	27.90	2.3295pgg	2.217gg	2.6896gg	3.00q	2.55o	2.55o	.45y	45.00hh
Dallas	19.25	28.65	....	4.05	....	3.50q	3.75o	4.35o	.36	58.50hh
Denver	19.50	28.40	3.29	5.15	3.04	2.84	2.30o	2.30o	.48ff	45.00
Detroit	19.00	27.90	3.35	3.25	2.50	2.656	2.409	2.409	.53	47.30
Kansas City	19.00	28.65	3.64	3.12	2.76	3.65	3.49o	3.49o	.58	83.70
Los Angeles	19.00	28.15	3.30n	4.50n	4.20n	2.90n	2.05en	l	.64ny	l
Minneapolis	19.00	29.88/28.02	....	....	....	2.835dd	2.358hidd	2.358hidd	.46idd	46.00r
Montreal	......	21.95	5.02Dfft	5.94Efft	4.65Fft	5.25f	4.65f	4.65f	1.60	....
New Orleans	......	......	....	....	....	3.15	2.62	2.62	0.756	
New York	19.00	27.90	....	....	....	2.84G	2.36Go	2.36Go	.463Gs	46.00*
Philadelphia	19.00	27.90	3.60	3.40/3.65	1.50/4.60	2.54	2.94	2.94	.37	26.00
Pittsburgh	19.00	27.90	3.10	3.36	3.68	3.72	2.85o	2.85o	.42	58.75
St. Louis	19.00	27.90	....	....	....	2.86*	2.44h	2.44h	.55y	54.33
San Francisco	19.00	28.15	2.95	4.15	3.40	2.58	1.79**	2.68	.53	52.00
Seattle	19.00	28.40	3.30mcc	4.02mcc	....	3.50mqcc	3.11hmcc	....	.51mcc	47.20mcc
Toronto	......	......	....	....	....	4.45	4.10	....	1.70	88.00

*‡ Delivered. * Note: Red lead in oil 50¢ higher than white lead in oil. *a Red lead prices change frequently due to pig lead price changes. *b U. S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e 15 lb. *f Per 432 sq. ft. *g F.o.b. yard, Roxbury. *h Per roll, 65 lb. *i Net carload lot prices; Minneapolis and vicinity. *k Per cwt. *l Not used. *m 1% discount for cash. *n F.o.b. city. *o Per 60-lb. roll. *p 6-drum. 50 gal. ea. *q Per 90-lb. roll. *r F.o.b. factory, Chicago. *s Truckload. *t Federal tax included; add 5% mun. & prov. tax. *u Per 90-lb. square. *v Per ton. *w Price to large paint contractors is $1.25 less *x Mineral surfaced. *y 55-gallon container. *z Drums. *aa 15 lb., 324 sq ft roll. *bb Roofers coating and cement; Price per ton. *cc LCL, truck delivery. *dd 2% cash discount. *ee Asphalt pitch in 100 lb. package. *ff 5-gal. drums. *gg F.o.b. factory. *hh Incl. freight. *ii per roll *D Std. Black. *E Ready-mixed. *F Over 80% ferric oxide. ** Aver. wt. approx. 425 to 550 lbs. drums. *G fob factory points

PLASTER, VERMICULITE AND METAL BUILDING SHEETS & TUBING

	PLASTER† Neat per ton	Gauging per ton	VERMICULITE† Home Insulation pellets	Plaster aggregate	Concrete Aggregate Untreated per bag of 4 cu ft	PERLITE Plaster Aggregate	Concrete Aggregate Untreated	ALUMINUM SHEETh Flatj .102" th 36"x96" & 48"x144" per lbr	Corr roof .032" th 35"x12" per shu	STAINLESS STEEL SHEET*-TYPE 302g 20 ga 48"x96 120" per cwthh	28 ga 36"x120" per cwtmm	COPPER WATER TUBING-TYPE L 2000 ft lots per fta ⅜"b	½"c
Atlanta	$30.00	$36.00	$1.55s	$1.65s	$1.80d	$1.65	$1.65	$0.425n	$9.55n	$57.76n	$65.76n	$19.51f	$27.45f
Baltimore	22.85	33.25	0.95	1.15	1.15	1.15	1.65	0.391	0.427r	56.25	64.25	0.2745	0.3366
Birmingham	38.00	43.00	1.55	1.55	1.80l	1.55	1.55	0.455	9.52	56.43	66.18	0.1951	0.2745
Boston	22.00	29.00	1.15/1.20	1.18/1.23	1.45	1.45	1.50	0.48p	26.15op	55.88dd	61.655ddff	0.1951	0.2745
Chicago	26.80	26.80	1.55	1.60	1.60l	1.50	1.50	0.455o	9.775#p	60.55#ee	68.55#ee	0.1951	0.2745
Cincinnati	21.60*s	21.60*s	1.75	1.75	1.75	1.38	1.44	0.400	8.66	60.95	66.70ff	0.1951	0.2745
Cleveland	28.00	43.00	1.12	1.16	1.24l	1.45	1.45	0.418aa	8.66	58.41	66.41	19.51f	27.45f
Dallas	29.80	31.80	1.20	1.25	1.30l	1.21	1.62	0.379	0.439r	55.00	63.00	0.1149	0.2029
Denver	25.00	25.00	1.45	1.35	1.50	1.40	1.50	0.455	9.23	58.14gg	66.44gg	0.2214	0.3114
Detroit	25.00	25.00	1.28	1.32	1.41	1.54	1.61	0.455	9.235	61.45	69.45	16.40foo	31.14f
Kansas City	30.00	35.00	1.20	1.30	1.40	1.35	1.50	0.431	10.32	60.72ee	68.72ee	22.14f	31.14f
Los Angeles	26.20	27.20	1.25ii	1.20ii	1.25ii		1.60	0.46	8.99	58.10	66.10	0.2214	0.3114
Minneapolis	32.00	32.00	1.50	1.60	1.80	1.25	1.25	0.462	8.65	56.45	64.20ff	0.1951	0.2745
Montreal	28.80	33.20	1.10	1.30	1.30	1.15v	1.15v	0.372	8.25	62.75		0.264	0.322
New Orleans	32.00	45.00	1.25	1.25	1.35	1.25	1.25	0.403	7.82	57.18	65.18	0.1987	0.2776
New York	24.00	30.00	1.25	1.25	1.30	1.30	1.30	0.445#oe	8.98#	58.48	66.48	19.51f	27.45f
Philadelphia	23.25	32.00	1.35	1.35	1.40			26.50#wx	7.55#	53.23#	60.98#	18.57f	26.09f
Pittsburgh	27.50	31.00	1.30	1.30	1.32	1.35	1.35	0.42	9.19	56.81	62.63	0.2045	0.2572
St. Louis	31.00	40.00	1.30	1.55jj	1.50	1.60	1.45	0.468io	9.50e	58.79kk	66.79kk	22.54fm	31.72fm
San Francisco	27.85	32.00	1.05	1.05	1.24	1.24	1.25	0.46	8.45cc	63.20e	71.20e	0.1951	0.2745
Seattle	38.00	41.00	1.45	1.25k	1.85l	1.40k	....	0.403	7.809	60.50ee	68.00ee	0.1951	0.2745
Toronto	32.50	42.00	1.20	1.30	1.35	....	....	0.397	21.55	62.75	95.00	0.3289pp	0.4136pp

† trucklots, delivered * carload # delivered *a fob city *b ½" O.D. *c ⅝" O.D. *d In 1M lb skids *e Previous prices were 5-10M lb bracket *f per 100 ft *g 5 tons & up; cold roll, anneal & pickled; 2B finish *h 15M lb *i 3003 alloy; 1100 alloy $0.456 lb *j 1100 & 3003 alloy, mill finish *k per bag of 3 cu ft *l treated with air entraining agent *m 2-10M ft *n fob plant, fr allow *o 5M lb & up *p 100 sq ft quantity *q 2M lb quantity *r per lb *s 30# bag *t 36" x 96; 10.81 lb sh; 48" x 144" 21.7 lb sh *u 19.31 lb sh *v fob plant *w 48" x 144" *x 36" x 96" $13.25 sh *aa 16M lb & up *bb fob mill *cc 26" x 6-12 *dd add $0.75 cwt for boxing *ee 4 tons & up *ff 26 ga *gg add $2 cwt boxing; $0.75 cwt on skids *hh Theoretical wt for 48" x 96"; 50.4-lb, per sh. *ii 300-bag lots *jj per 100-lb bag *mm Theoretical wt: 19.7-lb per sh. *nn Deliv. warehouse means *oo ¼" O.D. *pp Incl 10% sales tax



Installation of these two 5′-high SMS Bascule Gates on a dam 28′ in height will enable the City of Decatur, Illinois, to more than double its present water storage capacity, even in dry years. The training wall and concrete pier between the gates is designed to minimize downstream cross-flow and damage to the apron. Harza Engineering Co., Chicago, Illinois, Consulting Engineers.

Individual 29′-long sections of the gate are installed in graphited bronze bearing shoes. A Bascule Gate was chosen over other types here when engineering studies proved it most economical and simplest.

View from downstream side shows final connection of one of the several hydraulic operating cylinders for each gate. Piping on the face of the dam immediately below provides individual isolation of any cylinder.

One of the two 500 psi oil accumulator tanks is about to be raised into position at the control station. Pumps supply pressure to the accumulator tanks for emergency operation in the event of power failure.

New SMS Bascule Gate Design Provides a CLEAR CREST, UNLIMITED LENGTH

Now SMS Bascule Gates can be built to any length you need, and installed without intermediate piers or overhead structures. With this new SMS design, hydraulic operators are located under the gate leaves and controlled from either end. The installation shown above consists of two 233′9″ gates. They are the longest ever installed.

An SMS Bascule Gate will increase the storage and spillway capacity of existing dams quickly and economically. It enables you to control heavy run-offs without losing stored water, and to handle regional hazards like ice and heavy debris. In its open position, the gate lies flat on the dam crest and presents no obstruction to flow.

For full information on this new SMS Bascule Gate design—or on hydraulic turbines and other accessories—write to S. Morgan Smith Co., York, Penna.

SMS

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED, TORONTO

HYDRAULIC TURBINES
PUMPS
GATES & HOISTS
TRASH RAKES
LIQUID HEATERS

HYDRODYNAMICS

ROTOVALVES
BALL VALVES
BUTTERFLY VALVES
FREE DISCHARGE VALVES
CONTROLLABLE-PITCH SHIP PROPELLERS

Advanced hydraulics boost production with Gar Wood Buckeye ditchers !

EXCLUSIVE LIVE HYDRAULIC WHEEL HOIST positions digging wheel faster, more accurately and independent of all other operations. Instantly operated from seat by simple, one-hand controls.

EXCLUSIVE HYDRAULIC CONVEYOR DRIVE provides three discharge speeds in either direction . . . instant adjustment to handle any volume of spoil independent of any other function. No complicated shifting, no need to stop digging wheel or crawlers. Completely controllable from the seat.

These and other Buckeye features mean smooth, clean, low-cost ditching... more ditch per dollar with the greatest return on your capital investment. They also mean longer life, less maintenance and less downtime.

Find out more about these advanced Buckeye models: the 305, 307 and 308. See your Gar Wood-Buckeye dealer, or write to: Customer Service Department, Gar Wood Industries, Inc., Wayne, Michigan.

MORE FOR YOUR MONEY!

TRACTOR-TYPE CRAWLERS give long, trouble-free service life . . . simplify variation in tread width and bearing areas through a selection of pads for any type digging.

SIMPLIFIED GROUP CONTROLS, with panel-mounted conveyor and hoist controls, foot-operated steering controls. Control arrangement helps operator adjust to changing digging conditions faster, easier.

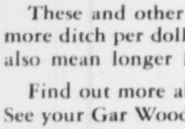
UNIT CONSTRUCTION provides interchangeability of major components and assemblies of all three new models.

TAPERED ROOTER BITS fit *inside* holders, are pitched for proper bit angle and bucket heel clearance. Last longer . . . can be replaced easier and at a much lower cost.

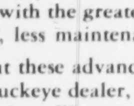
GAR WOOD INDUSTRIES, INC.

Wayne, Michigan • Findlay, Ohio

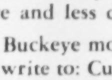
Plants in Wayne and Ypsilanti, Mich.; Findlay, Ohio; Mattoon, Ill.; Richmond, Calif.



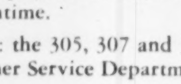
Gar Wood Excavators



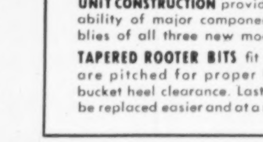
Gar Wood Tractor Equipment



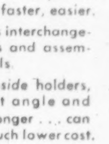
Gar Wood Winches



Gar Wood-Buckeye Finegraders



Gar Wood-Buckeye Ditchers



Gar Wood-St. Paul Hoists & Bodies

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. WETZEL, L. M. FELIX, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Stamford**—OFFICE—BA About 9/15—Dorr-Oliver, Inc., Barry Pl., air-conditioned office. $2,500,000. Sherwood, Mills & Smith, 65 Broad St., archts. Werner Jensen Assocs., 641 Summer St., consult. engrs. CD 3/19.

HEAVY CONSTRUCTION—LB & CA

V. F. Capaldi Constr. Co., 1465 Atwood Ave., Johnston, R. I., CA **$856,892**, est. $900,000. Contr. 2 main and lateral sewers, JOHNSTON, R. I. Town, Sanitary Dist. Comn., Town Hall, Johnston, R. I. Bids June 25. CD 7/3, under LB.

BUILDINGS—LB & CA

Owner, c/o Walter J. Riley, agt., 216 Appleton St., Lowell, Mass. Owner Builds. **$348,000**. RESIDENTIAL DEVELOPMENT "Kingsboro Pleasant Valley" 28 houses, north of Rte. 128 and Kingsboro Bridge, BEDFORD, MASS.

Mahoney Corp., Tewksbury, Mass. CA Approx. **$345,000**. RESIDENTIAL DEVELOPMENT "Garden Acres" 30 houses, off Shawsheen St., TEWKSBURY, MASS. Owner, c/o Walter J. Riley, Main St., Tewksbury, Mass.

▲ **State R. I. & Prov. Plants, Div. Purchase,** State House, Providence, R. I., rejected bids June 20, Proj. URI-3, HHFA-Proj. RI 37-CH-1, 2 WOMEN'S DORMITORIES and DINING HALL, University of Rhode Island, KINGSTON, R. I., LB **$1,177,000**. New bids July 18. CD 6/29, under LB.

▲ **Alton Constr. Co.**, 1645 Warwick Ave., Warwick, R. I., CA, **$1,300,000**. 22 store brick veneer 110,000 sq. ft. SHOPPING CENTER, Post Road, WARWICK, R. I. Realty Trust Co., c/o Thomas Muradian, 62 East St., Whitinsville, Mass. Richard Malkasian, 101 Tremont Ave., Boston, Mass., engr.

▲ **M. J. Megin, Inc.**, 51 Elm St., Naugatuck, Conn. CA general constr. GENERATING STATION, West Side of harbor, BRIDGEPORT, CONN. Total est. cost **$8,000,000**. United Illuminating Co., 80 Temple St., New Haven, Conn. CD 3/19;
C. W. Blakeslee & Sons, Inc., 58 Waverly St., New Haven, Conn. CA substructure (Bridgeport, Conn.);
Pittsburgh Bridge & Iron Works, Inc., 103 Park Ave., New York, N. Y. CA superstructure structural steel (Bridgeport, Conn.).

▲† **B. Perini & Sons, Inc.**, 73 Montwait Ave., Framingham, Mass., CA, **$1,757,888**, AIR LABORATORY, Hartford Research Center, ENG-19-016-56-19, MIDDLETOWN, CONN. U. S. Eng., 150 Causeway St., Boston, Mass. CD 1/11/55.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

N. Y., Idlewild—PAVING AND DRAINAGE IMPRVS.—BA 7/30—Dpt. Purchase & Administrative Services, Port of New York Auth., 111 Eighth Ave., New York, Zone 11, Contr. O & M 389, paving and drainage imprvs. on roadways and taxiways at New York International Airport. Plans deposit $10. CD 2/25/53.

N. Y., Jackson Heights—PAVING IMPRVS.—BA 7/30—Dpt. Purch. and Administrative Services, Port of New York Auth., 111 Eighth Ave., New York, Zone 11, Contr. O & M 391 paving imprvs., seal coating at LaGuardia Airport. Plans deposit $10.

New Jersey—TOLL ADMINISTRATION BLDG.—BA 8/2—State Hy. Auth., 12 Broad St., Red Bank, Garden State Parkway Contr. No. 210, Sect. IA, constr. toll admin. bldg, Washington Twp., Bergen Co.

BUILDINGS—BA

N. Y., North Bellmore—SCHOOL—BA 7/30—Bd. Educ. Union Free School Dist. No. 4, town of Hempstead, Sawmill Rd. School, Sawmill Rd., North Bellmore, Regent Place School, Armond Place, Ashland Place, Regent Place and Elm Court, Plans deposit $50 for general constr., $25 for trades, Frederic P. Wiedersom Assoc., 85 W. Hawthorne Ave., Valley Stream, archts.

N. Y., North Bellmore—SCHOOL—BA 7/30—Bd. Educ., Union Free School Dist. No. 4, town of Hempstead, Saw Mill Rd. School, Saw Mill Rd., North Bellmore, Park Avenue School, Park Ave., Walnut Ave., Pine St., Merrick. Plans deposit $50 for general constr., $25 for trades; Frederic P. Wiedersum, 85 W. Hawthorne Ave., Valley Stream, archt.

▲ **N. J., West New York**—HIGH SCHOOL—BA 7/31—Chancery Diocese of Newark, 33 Mulberry St., Newark, N. J., high school for St. Joseph's Roman Catholic Church, 64 St., West New York, N. J. $2,000,000. Ricker & Daxt, 6115 Hudson Ave., West New York, archts.

▲ **N. J., Paramus**—SCHOOL—BA 8/1—Bd. Educ., Paramus Borough, Borough Hall, Paramus, high school. $2,200,000. Lawrence Licht, 19 Knickerbocker Rd., Englewood, archt. CD 4/16.

HEAVY CONSTRUCTION—LB & CA

▲ **The Foundation Co.**, 57 William St., New York, N. Y. CA **$4,103,000**. central heating and refrigeration plant in Central Terminal area incl. paving, furnishing, installing utilities, N. Y. International Airport, Contr. NYA 650.033, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids June 26. CD 6/15.

Burkholder Bros., 258 Irvington Dr., Tonawanda, N. Y. CA **$289,974**. water line installations in 3 sections, TONAWANDA, N. Y. Town, Municipal Bldg., Kenmore, N. Y. Bids May 28. CD 5/23.

Conduit & Foundation Corp., 158 N. 20 St., Phila., Pa. LB **$219,304**. Paving Bid 3824, PHILA., PA. City, Dpt. Procurement, City Hall Annex, Phila., Pa. Bids June 28. CD 6/13.
Union Paving Co., 1227 N. Broad St., Phila., Pa. LB **$200,165**. Paving Bid 3822 (Phila., Pa.);
Mack Paving & Constr. Co., C and Luzerne Sts., Phila., Pa. LB **$79,666**. Paving Bids 3812 and 3831. LB **$75,986**, Paving Bid 3813 (Phila., Pa.);
Asphalt Paving & Supply Co., Box 57, Norristown, Pa. **$75,460**. Paving Bid 3811 (Phila., Pa.);
John Meehan & Son, 916 W. Dakota St., Phila., Pa. LB **$205,114**. Paving Bid 3824 (Phila., Pa.);
Glasgow, Inc., Glenside, Pa. LB $110,269. Paving Bid 3823 (Phila., Pa.);
Armour Excavating Co., Inc., 7921 Oxford Ave., Phila., Pa. LB **$149,292**. Paving Bids 3816 and 3420 (Phila., Pa.).

† **Grinnell Co., Inc.**, 2402 W. Fayette St., Baltimore 23, Md. CA **$519,800**. sprinkler sys. in 49 bldgs., Army Chemical Center, ENG-18-020-56-32, EDGEWOOD, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. CD 7/5, under LB.

BUILDINGS—LB & CA

▲ **John W. Cowper Co., Inc.**, 775 Main St., Buffalo, N. Y. CA **$1,652,300**. MECHANICAL ENGINEERING BLDG., ITHACA, N. Y. Cornell University, Itahaca, N. Y. CD 7/10, under LB.

▲ **Whittier Homes**, c/o Irwin Jalonack, at site, Kingston, N. Y. Owner Builds. **$6,000,000**. first 400 of 4,000 HOUSES on 1,500 acre tract on Rte. 32, KINGSTON, N. Y. Herman H. York, 90-04 161 St., Jamaica, N. Y., archt. Leo Novick, 150 E. 35 St., New York 16, N. Y., engr. CD 7/17.

▲ **Westinghouse Electric Corp.**, Box 868, Pittsburgh 30, Pa. CA Est. **$8,000,000**. 250,000 kw turbine GENERATOR for Indian Point Nuclear Station, PEEKSKILL, N. Y. Consolidated Edison Co. of New York, 4 Irving Place, New York, N. Y. CD 2/14/55.

▲ **Peerless Builders, Inc.**, c/o B. J. Bergton, 392 S. Washington Ave., Bergenfield, N. J. CA Est. **$1,125,000**. 23 HOMES, Pascack Ave., EMERSON, N. J. B. J. Bergton, 392 S. Washington Ave., Bergenfield, N. J. Leonard Feinen, 320 Lincoln Ave., Hasbrouck Heights, N. J., archt.

▲† **R. M. Duval Constr. Co., Inc.**, 54 State Hy. No. 17, Paramus, N. J., CA, **$1,273,177**, 6 buildings, site imprvs., utilities, ENG-36-109-56-66, FORT DIX, N. J. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. Bids June 13, CD 6/26, under LB.

▲ **Ajax Associates, A.** Simon, pres., 412 W. Front St., Plainfield, N. J. Owner Builds, **$3,750,000**. 256 HOMES known as Somerset Hills Estates, FRANKLIN TWP., N. J. William G. Chirgotis, 968 Stuyvesant Ave., Union, N. J., archt.

▲ **American Bldg. Supply Co.**, Long Branch, N. J., LB **$1,186,000**. general contract Central SCHOOL addn., MIDDLETOWN, N. J. Bd. Educ., Middletown Twp., Middletown, N. J. CD 4/23.

† **Costanza Constr. Co.**, 3001 Vineyard Lane, Baltimore 18, Md. CA **$656,440**. 3 story, H-shaped, 117x235 ft. enlisted men's BARRACKS, 2 story, 59x78 ft. KITCHEN and MESS HALL WING, ENG-18-020-56-21, ABERDEEN PROVING GROUND, MD. U. S. Eng., 24 St. and Maryland Ave., Baltimore 18, Md. CD 6/20, under LB.

▲ **Capitol Constr. Co.**, 3625 Wilkens Ave., Baltimore 29, Md. LB **$889,000**. (6 bidders) combined bids on nurses' RESIDENCE and PHARMACY Lombard and Greene Sts., University of Maryland, BALTIMORE, MD. State, Dpt. P. Imprvts., 506 Park Ave., Baltimore 1, Md. Bids July 10, CD 7/2;
Bickerton Constr. Co., 101 W. 22 St., Baltimore 18, Md. LB **$375,700**. (9 bidders) 3 story nurses residence (Baltimore, Md.);
Baltimore Contractors, Inc., 711 S. Central Ave., Baltimore 2, Md. LB **$486,000**. (7 bidders) 2 story, 100x112 ft. masonry pharmacy bldg. (Baltimore, Md.).

▲ **Christian Developers, Inc.**, 1221 N. Conestoga St., Phila., Pa., Separate Contracts, **$1,500,000**. 102-unit RESIDENTIAL DEVELOPMENT, Glasgow Rd., BEAR, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

† **Mississippi**—BA 8/2—U. S. Eng., P.O. Box 60, Vicksburg, approx. 1,523,000 cu. yd. earthwork and placing approx. 280 cu. yd. grav. road surf. on east bank of Mississippi River in Bolivar Co.

▲ **Florida**—POST OFFICE—BA 8/10—General Services Admin., Pub. Bldgs. Service; General Services Bldg., 19 and F Sts. N.W., Wash., D. C., construct and lease 2 story, 150,000 sq. ft. U. S. Post Office, Goose Pond Sect., 31 St. and First Ave. North. Plans deposit $40. Gay & Calwell Assoc., 7217 Gulf Beach Blvd., St. Petersburg, archts. Charles T. Healy, 104 Jackson St., Tampa, engr.

▲ **Ky., Owensboro**—BA 8/21—city, sewage treatment plant, intercepting sewer. $2,450,000. Plans deposit $90 treatment plant, $75 sewers, station, $70 sewers. Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago, Ill., engrs. for treatment plant. Johnson-Deep & Quisenberry, 915 Frederica St., Owensboro, engr. for sewers. CD 6/19.

BUILDINGS—BA

▲ **Ky., Fort Knox**—HOUSING—BA 8/2—U. S. Eng., 830 W. Broadway, Louisville, construct and finance 2,049 housing units, (Capehart), ENG-15-029-56-86. $26,000,000. Extended date. CD 6/19.

▲ **La., Fort Polk**—HOUSING—BA 8/23—U. S. Eng., Box 1229, Galveston, Tex., construct and finance, 2,000 family housing units, (Capehart), ENG-41-243-57-1, $15,000,000. CD 7/13.

BUILDINGS—SLC

▲ **Ala., Fort Rucker**—HOUSING—U. S. Eng., 2301 Grant St., Mobile, Zone 2, soon lets contract construct and finance 120 housing units at Army Aviation Center. CD 4/23, under Ala., Camp Rucker.

HEAVY CONSTRUCTION—LB & CA

▲ **VIRGINIA**—Richmond-Petersburg Turnpike Auth., 1015 E. Main St., Richmond,
Blythe Brothers Co., P. O. Box 989, Charlotte, N. C. LB **$1,581,804** (9 bidders) grading, drainage, paving, structures, approx. 2.5 mi. Contr. D-1-G, Sect. D, from Appomattox River to point 3,600 ft. north of Rte. 624 in Colonial Heights, Chesterfield Co. Bids July 12. CD 6/14.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposa.
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: **Before and including appointment of engineers or architects.**

BIDS ASKED: BA **(new announcements only). For full calendar, see also preceding issues.**

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB **On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.**

CONTRACTS AWARDED: CA **Except awards to low bidders previously reported in low bidder stage.**

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see Construction Daily.

▲ **VIRGINIA**—Commonwealth of Va., Dpt. Hys., Central Hy. Office Bldg., 1221 E. Broad St., Richmond,

Nello L. Teer Co., P. O. Box 1131, Durham, N. C., LB **$1,972,349** (2 bidders) Hampton approach hy. and structures, Contr. B-3, City of Hampton. CD 6/3/53, under Unclassified.

R. W. Miller Constr. Co., Inc., 1511 Neave St., Covington, Ky., LB **$650,000**, est. $598,495. sewage treatment plant, MOUNDSVILLE, W. VA. City, City Hall, Moundsville, W. Va. Bids July 9. CD 6/28.

SOUTH CAROLINA—State Hy. Dpt., Hotel Jefferson, Columbia,

rejected bids June 19, 306.5 ft. prestressed concrete bridge over Coosawhatchie River, Hampton Co.; 204.5 ft. prestressed concrete bridge over Cypress Creek, Jasper Co., both on State Rte. 128, S. C. Dockets Nos. 25.330 and 27.777, F.A. Proj. Nos. S-189 (3) and S-188 (3), Hampton and Jasper Counties. CD 6/7.

SOUTH CAROLINA—State Hy. Dpt., Hotel Jefferson, Columbia,

rejected bids June 19, hydraulic embankment 1.523 mi. US Rte. 501 and connection. S. C. Docket 26.344.1, F.A. Proj. F-7 (4), Horry Co.; macad. base course, constr. concrete curb and gutter, concrete sidewalk, 1.481 mi. US Rte. 176, S. C. Docket Nos. 42.378 and 42.434, F.A. Proj. U-2604 (3), Spartanburg Co. CD 6/7.

▲ **SOUTH CAROLINA**—State Hy. Dpt., Hotel Jefferson, Columbia,

Cherokee, Inc., P.O. Box 1296, Columbia, S. C. CA **$1,336,528**, b. conc. surf., constr. curb and gutter, concrete sidewalk for widen to four lanes 9.04 mi. US Rte. 17, S. C. Docket 10.432, F.A. Proj. Nos. U-145 (3) Part 2, F-81 (5) Parts 1, 2 and 3 and FG-81 (6). Charleston Co. Bids June 16. CD 6/27, under LB.

† **Clarence Mobley Contg. Co.**, 640 11 St., Augusta, Ga., LB **$497,700**. chapel, outdoor recreation facilities, NCO club and advance base gear facilities, Marine Corps Auxiliary Landing Field, NOy 94266, BEAUFORT, S. C. P. Wks. Office, Dpt. Navy, Naval Base, Charleston, S. C.

BUILDINGS—LB & CA

▲ **J. W. Bateson, Inc.**, Gibraltar Life Bldg., Dallas, Tex., CA **$7,965,482**, construct and finance, Capehart Family HOUSING, 600 units, 107 bldgs., ENG-44-110-56-26, FORT EUSTIS, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids June 20, awarded July 10. CD 6/26, under LB.

J. F. Holley Constr. Co., Inc., 905 Sixth Ave. N., Birmingham, Ala. LB **$443,000**. (4 bidders) BIOLOGY BLDG. Lakeshore Dr., Homewood, BIRMINGHAM, ALA. Howard College, 7725 Second Ave. S., Birmingham, Ala. Bids July 10. CD 6/26.

▲† **U. S. Eng.**, 306 Federal Bldg., Nashville, Tenn., rejected bids June 28, A-3 dispensary bldgs., B-3 post exchanges, C-theater, D-2 motor repair bldgs., 13 classroom bldgs., H steam distr. sys. and boiler, paving, ENG-40-058-56-45, FORT CAMPBELL, KY. Will re-advertise. CD 7/3, under LB.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Ill., Peoria—BA 8/7—Peoria Sanitary Dist., foot of Darst St., sanitary sewers University Ave. from W. Lake Ave. $700,000. CD 2/1.

BUILDINGS—BA

Mich., Litchfield—SCHOOL—BA 8/2—Bd. Educ., Litchfield Community Schools, Roberta Ansbaugh, secy., constr. Senior High School, Louis C. Kingscott & Assoc., Inc., 511 Monroe St., Kalamazoo, archt. CD 1/30.

Wis., Minocqua—HIGH SCHOOL—BA 8/6—Lakeland Union High School Dist., Minocqua, 1 story, T-shaped, 115x155 ft. high school. $995,000. L. Monbery & Assocs., 815 7th St., Kenosha, archts. CD 3/7.

Wis., Milwaukee—CHURCH, etc.—BA 8/7—St. Sava Serbian Orthodox Church, c/o E. Drobac, 238 W. Wisconsin Ave., church bldg., Sunday School and rectory. $400,000. Plans deposit $50. P. E. Camburas, 105 W. Madison St., Chicago, Ill., archt. CD 8/24.

Wis., Neenah—SCHOOL—BA 8/7—Bd. Educ., Neenah, 1 story, 142x168 ft., concrete, steel, brick and block grade school. $472,500. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts. CD 6/21.

▲ **O., Salem**—SCHOOL—BA About 10/1—Bd. Educ., Salem, Senior High School, 24-acre site. $2,585,000. Fulton, Krinsky & Dela Motte, 6014 Euclid St., Cleveland, Zone 3, archts. CD 11/14.

BUILDINGS—SLC

▲ **Wis., Sturtevant**—SEMINARY—St. Bonaventure Minor Seminary and High School, Sturtevant, soon lets contract seminary. $1,400,000. T. J. Higgins Assocs., Inc., 228 N. La Salle St., Chicago, Ill., engr. CD 2/8.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

O.—**The Union Building & Constr. Corp.**, 631 Main Ave., Passaic, N. J., CA **$4,471,711**, est. $4,471,600, Type T-71 and structures 6.361 mi. U.S.R. 40R, Sect. 6.97, Bethel and Springfield Twps., and City of Springfield, Clark Co.;

O.—**The Peirce Constr. Co.**, 3005 Bellevue Rd., Toledo, O., CA **$731,209**, est. $764,200, Type T-35 and structure 6.73 mi. S. R. 53, Sects. 0.00, 17.58, Sandusky and Seneca Counties;

O.—**Frysinger Constr. Co.**, 3770 N. High St., Columbus, O. CA **$833,375**, est. $878,100, Type T-35 and structures 10.18 mi. U. S. R. 23, Sects. (0.00-2.04), Marion and Wyandot Counties.

O.—**Foley Constr. Co.**, 5050 Orchard St., Cincinnati, O. CA **$1,333,069**, est. $1,460,500, Type T-35, T-71 and structure 0.531 mi. U. S. R. 50, Sect. 22.85, City of Cincinnati, Hamilton Co.;

O.—**Ralph Myers Contg. Corp.**, Box 235, Salem, Ind. CA **$2,480,957**, est. $2,565,500, Type T-35 on B-20 and structures 3.32 mi. S. R. 7, Sects. (8.22-10.35) F-430 (11), Jefferson Co.;

O.—**The Crawford Constr. Co. Inc.**, 782 Charles St., Galion O., CA **$100,284**, est. $111,600, Type T-35 and structure 0.509 mi. S. R. 546, Sects. (4.82-5.01) (6.51), Richland Co. Grand total $9,950,605. Bids June 26. CD 7/5, under LB.

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,

O.—**A. J. Ronyak, Inc.**, Box 277 Burton, O., LB **$171,359**, est. $171,400 (2 bidders) Type T-35, 4.114 mi. SR 306-7.96, S-46 (6), Geauga Co.;

O.—**Herman B. Hune**, Box 284, Marietta, O., LB **$177,419**, est. $210,400 (3 bidders) type T-35 on B-119 and culverts 1.202 mi. SR 776-(7.82) (8.42) (9.38) (10.67), S-1214 (1), Jackson Co.;

O.—**The Northeastern Road Improvement Co.**, Pelton Rd., Willoughby, O., LB **$81,412**, est. $93,700 (1 bidder) Type T-35 on B-33, 3.679 mi. CR No. 417, S-1224 (1), Lake Co.;

O.—**Hart Constr. Co.**, 460 Oberlin Rd., Elyria, O., LB **$200,376**, est. $193,300, Type T-32, 3.342 mi. CR No. 58, S-1198 (1), Lorain Co.;

O.—**The Murray Constr. Co.**, 316 W. Emmitt Ave., Waverly, O., LB **$191,203**, est. $203,300, (6 bidders) Type T-35 on B-119 and structure 0.819 mi. SR 772-11.16, S-1211 (1), Pike Co.;

O.—**The W. M. Brode Co.**, 100 Elizabeth St., Newcomerstown, O., LB **$848,203**, est. $756,600 (4 bidders) Type T-35, Type T-71 and structure 0.71 mi. SR 12-(0.64-1.08), U-UG-646 (3), City of Fostoria, Seneca Co.;

O.—**The Harry Miller Excavating Co., Inc.**, Suffield, O. LB **$4,209,101**, est. $4,510,000 (9 bidders) Type T-71 and structures 12.319 mi. USR 21-71.80, 0.00, 0.00, F-1010 (3), Stark, Summit and Wayne Counties;

O.—**Sidwell Bros.**, Rte. 2, South Zanesville, O., LB **$171,565**, est. $177,600, (2 bidders) Type T-35, 7.724 mi. SR 158-(1.75-9.46), Village of Baltimore, City of Lancaster, Fairfield Co.;

O.—**W. E. Engle**, McArthur, O., LB **$77,672**, est. $68,600 (2 bidders) Type T-35 on B-119 and culverts 0.372 mi. SR 138-(5.00) (6.20), Ross Co.;

O.—**B. and G. Bituminous Co.**, P. O. Box 538, Sidney, O. LB **$101,194**, est. $84,000, (1 bidder) Type T-35, 1.08 mi. USR 25-(7.26-7.93), city of Sidney, Shelby Co.;

O.—**Elmer Vogt, Inc.**, Massillon, O., LB **$374,170**, est. $430,000 (2 bidders) Type-71 and T-35, 1.008 mi. USR 21-11.39, City of Massillon, Stark Co.;

O.—**C. P. Calaway**, 1220 Madison Ave., Toledo, O., LB **$173,866**, est. $186,500 (3 bidders) Type T-35 on B-119 and structure, 0.303 mi. SR 93-(0.23-0.35), Summit Co. Bids July 10. CD 6/29.

OHIO—State Hy. Dpt., Columbus, Zone 15,

rejected bids June 26, Type T-35 6.446 mi. S.R. 163, Sects. (31.86-37.16), S-1104 (2), Ottawa Co., LB **$434,732**; c. conc. 1.707 mi. S.R. 48, Sects (6.97-7.49), Montgomery Co. LB **$923,464**; grading, draining, wid'n. resurf. in part with b. conc. and paving in part with b. conc. surf. on crushed aggregate base 1.12 mi. SR 44, Sect. 11.27, Stark Co. LB **$133,729**. CD 7/5, under LB.

Pacific Flush Tank Co., 4241 N. Ravenswood Ave., Chicago, Ill., CA **$682,042**, sewage treatment plant, TOLEDO, O. City, Dpt. Sewage Disposal, Arthur W. Niles, comr., City Hall, Toledo, O. CD 4/16/53.

▲ **Dravo Corp.**, Neville Island, Pittsburgh, Pa., LB **$1,324,750**, (2 bidders) general constr. intake tower and pumping station at Berlin Reservoir; LB **$96,885**, (2 bidders) pumping equip., YOUNGSTOWN, O. Mahoning Valley Sanitary Dist., P. O. Box 298, Youngstown 1, O. Bids July 10. CD 6/8;

Carlson Electric Co., 121 E. Boardman St., Youngstown, O., LB **$131,780**, (3 bidders) electrical work (Youngstown, O.).

▲ **ILLINOIS**—Illinois State Toll Highway Comn., 20 N. Wacker Dr., Chicago, Zone 6,

Arcole Midwest Corp., 3225 Main St., Skokie, Ill. and **S. J. Groves & Sons Co.**, 1104 W. Reynolds St., Springfield, Ill., LB **$2,025,000** grading and bridge sections for test road between LaSalle and Ottawa approx. 9 mi. long, earth grading necessary for constr. of embankments within test area, one 6-span steel I-beam grade separation structure carrying Loe Tree Road over test road and three 4-span steel I-beam grade separation structures, carrying Osage, Naplate and Terra Cotta roads over the test road. CD 6/4/54.

▲ **Contg. & Material Co.**, 1235 Dodge St., Chicago 26, Ill. LB **$215,479**. paving Augusta Blvd. from Grand to Noble, Noble from Cortez to Erie, Erie from Cortez to Union Sts., CHICAGO, ILL. Cook Co., County Bldg., Chicago, Ill. Bids July 10. CD 7/2;

Gallagher Asphalt Co., Thorton, Ill. LB **$481,962** paving Burnham Ave. from 186 to Schram Rds., Lansing (Chicago, Ill.);

Allied Asphalt Paving Co., 13912 S. Halsted St., Riverdale, Ill. LB **$244,672**. Wolf Rd. at Harrison Ave. widen, Hillside (Chicago, Ill.);

Municipal Paving Co., 5959 Ogden St., Cicero, Ill. LB **$256,219**. paving 26 St. from Des Plaines Sts. to Harlem Ave. also Westover to 26 Sts., North Riverside (Chicago, Ill.).

▲ **Bd. Park Comrs., East St. Louis Dist.**, 2929 Missouri Ave., East St. Louis, Ill., rejected bids June 26, swimming pool with imprvs. and equip., automobile parking imprvs., sewer, water and gas systems, Jones Park; swimming pool, community bldg., equip., sewers, water and gas sys., Lincoln Park, EAST ST. LOUIS, ILL. Est. **$1,800,000**. CD 7/13, under LB.

▲ **Douglas-Cloud Co.**, 1017 Penobscot Bldg., Detroit 26, Mich. LB **$2,318,860**. constr. bldg. to house incinerators, (4) appurtenant equip. and chimneys, DEARBORN, MICH. Bd. Trustees Dearborn-Melvindale Disposal Auth., Dpt. of Law, City Hall, Dearborn, Mich. Bids June 21. CD 6/5.

BUILDINGS—LB & CA

▲ **Bd. Educ.**, 608 E. McMillan St., Cincinnati, O. rejected bids June 26, Woodard Junior and Senior HIGH SCHOOL addns., Reading and Seymour Rd., CINCINNATI, O. LB **$1,060,940**. CD 7/2, under LB.

▲ **Arthur G. McKee & Co.**, 2300 Chester St., Cleveland, O., CA, **$3,700,000**. Alkylation PLANT at No. 1 Refinery, CLEVELAND, O. Standard Oil Co. of Ohio, Midland Bldg., Cleveland 15, O. CD 6/8.

▲ **Joseph Bucheit & Sons, Constr. Co.**, 4040 Simon St., Youngstown, O. CA Est. **$1,500,000**. 170,000 sq. ft. brick, steel WAREHOUSE and OFFICES, on 42-acre site Lexington-Springmill Rd., MANSFIELD, O. Tracy & Avery Co., 163 N. Diamond St., Mansfield, O. Ballinger-Meserole Co., 121 N. Broad St., Phila., Pa., engr. Awarded June 22.

A. L. Jackson Co., 300 W. Washington St., Chicago 6, Ill. CA **$600,000**. OFFICE, 5617 Sheridan Rd., CHICAGO, ILL. Grant Advertising Inc., 919 N. Michigan St., Chicago, Ill. E. F. Quinn, 134 N. LaSalle St., Chicago 2, Ill., engr. Awarded July 6.

Campbell Constr. Co., 9301 Michigan Ave., Detroit, Mich. CA **$356,200**. BOTTLING PLANT and WAREHOUSE addn., Hastings St., DETROIT, MICH. The Stroh Brewery Co., 909 E. Elizabeth St., Detroit, Mich.

August B. Johnson Co., Flint, Mich. CA Est. **$950,000**. HIGH SCHOOL, North Genesee and Crosby Sts., Kearsley, FLINT, MICH. Bd. Educ., Kearsley School Dist. No. 14, Genesee and Richfield Rds., Flint, Mich. Bids May 22. CD 5/10.

Alfred A. Smith Constr. Co., 721 E. Saratoga St., Ferndale, Mich. CA **$941,514**. Dondero Senior High SCHOOL addn., N. Washington St., ROYAL OAK, MICH. City, Bd. Educ., 1026 N. Main St., Royal Oak, Mich. Bids June 20. CD 6/8.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

† **Ark., Jacksonville**—APRON PAVING—BA 8/9—U. S. Eng., P.O. Box 867, Little Rock, reseal apron paving joints, Little Rock Air Force Base. $100,000-$500,000. CD 10/17.

† **Ark., Jacksonville**—ACCESS ROAD—BA 8/16—U. S. Eng., P.O. Box 867, Little Rock, dual access roads, Little Rock Air Force Base. $100,000-$500,000. CD 10/17.

BUILDINGS—BA

▲ **Okla., Lawton**—HIGH SCHOOL—BA 8/6—Bd. Educ., Lawton, high school. $1,650,000. Noftsger & Laurence, 2736 N. W. 23 St., Oklahoma City, archts. CD 4/5.

Mont., Helena—OFFICE—BA 8/14—State Hy. Dpt., Helena, 5 story, rein. con., steel office wing addn. to Hy. Dpt. Bldg. $750,000. Plans deposit $50. Bordeleau-Pannell & Amundson, Helena, archts. CD 7/9.

Tex., San Antonio—SCHOOL—BA 8/14—San Antonio Independent School Dist., Lavaca and Matagorda Sts., James Whitcomb Riley School, Nebraska and Eva Jo St. $650,000. Extended date. Phelps & DeWees & Simmons, 342 W. Woodlawn St., Reginald Roberts, 2600 N. McCullough Ave. and R. Vander Stratten, 244 W. Olmos Dr., archts. CD 6/21.

▲ **Tex., Austin**—HEALTH DPT. HEADQUARTERS, LABORATORIES—BA 8/15—State Dpt. Health, c/o Dr. Henry A. Holle, State Comr. Health, 410 E. 5 St., Health Dept. Headquarters and Laboratories, incl. 4 story administration bldg., laboratories, vital statistics bldg., warehouse, $3,750,000. Plans deposit $75. Page, Southerland & Page, 602 West Ave., archts., Wilson & Cottingham, Brown Bldg., engrs. CD 5/16.

▲ **Tex., Dallas**—HOSPITAL—BA 8/15—Parkland Memorial Hospital, 5201 Harry Hines Blvd., Dallas, hospital expansion $1,135,000. Extended date. Roscoe P. DeWitt, 4657 Mockingbird Lane, archt. CD 6/19.

▲ **Tex., Houston**—SCIENCE—Bids Asked—Texas Southern University, 3201 Wheeler St., science bldg. $1,410,000. Wyatt C. Hedrick, 5201 Fannin St., archt. CD 2/2.

HEAVY CONSTRUCTION—LB & CA

City, H. E. Tofte, clk., Northfield, Minn. rejected bids June 5, sewage treatment plant, interceptor sewer, NORTHFIELD, MINN. LB **$553,305**. Will readvertise in 1957. CD 6/11, under LB.

† **W. A. Lynn Constr. Co.**, 1022 Trust Bldg., Lincoln, Neb. LB **$405,600** (7 bidders) constr., repair approx. 27,110 lin. ft. pile dikes and revetment Mt. Vernon to Atchison Bends, Mile 489.0 to 434.5 St. Joseph, Buchanan Co., Spec. No. 56-121, MISSOURI. U. S. Eng., Federal Office Bldg., Kansas City, Mo. Bids July 10. CD 6/25/44.

Clarkson Constr. Co., 4133 Gardner Ave., Kansas City, Mo. CA **$551,734**. constr. second 74 ft. pavement east of Richards Rd. from Municipal Air Terminal No. 1, 4 mi., North Kansas City, KANSAS CITY, MO. City, City Hall, Kansas City, Mo. Bids July 6, awarded July 9. CD 8/6/54.

† **Pine Bluff Sand & Gravel Co.**, foot of Nebraska St., Pine Bluffs, Ark., LB **$546,965**, est. $560,120 (7 bidders) constr. and repair approx. 31,120 lin. ft. pile dikes and revetment, Rulo to Mount Vernon Bends, Mile 514.8 to 489.0, CIVENG 23-028-56-120, NEBRASKA. U. S. Eng., 1800 Federal Office Bldg., 911 Walnut St., Kansas City 6, Mo. Bids July 10. CD 6/12.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Okla.—**Collins Constr. Co.**, Hastings, Okla., CA **$87,702**, est. $91,744, concrete, steel bridge over Red River at Quartz Mountain Park, Kiowa Co.;

Okla.—**Duard Pyle**, 3409 Classen St., Oklahoma City 18, Okla., CA **$587,361**, est. $580,141, concrete, steel bridge over Canadian River west of Bethany on 66, Oklahoma Co.;

Okla.—**Southern Constr. Co.**, 1409 W. Reno St., Oklahoma City, Okla., CA **$183,372**, est. $201,207, two highway grade separations US 77 and bypass at Oklahoma City, Oklahoma Co.;

Okla.—Banta Constr. Co., Enid, Okla., CA **$290,252**, est. $305,379, concrete, steel bridge over Chicaskia River, Hy. 177 at Blackwell, Kay Co.;

Okla.—**W. E. Logan & Sons**, Barnes Bldg., Muskogee, Okla. CA **$92,204**, est. $109,465, two highway grade separations, US 75 at Beggs, Okmulgee Co. Grand total $1,240,891. Bids July 10. CD 6/28.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,

Okla.—**Admiral Paving Co.**, 5501 E. Admiral St., Tulsa, Okla., CA **$324,205**, est. $316,725, conc. 1.099 mi. US 66, at Hy. 33 junct. near Catoosa, Roger Co.;

Okla.—**Brewer & McMichael**, Holdenville, Okla., CA **$89,750**, est. $93,786, 0.132 mi. park road at State Park east of Kingston, Marshall Co.;

Okla.—**Broce Constr. Co.**, Woodward, Okla., CA **$83,375**, est. $100,955, stabil. aggregate base with double bit. surf. 1.572 mi. park road at Quartz Mountain, Kiowa Co.;

Okla.—**Clark Constr. Co.**, Woodward, Okla., CA **$141,945**, est. $148,543, grade, drain 7.974 mi. Hy. 54 near Cloud Chief, Washita Co.; CA **$78,709**, est. $90,020 grade, drain 0.429 mi. US 66 east of Canadian Co. line, Bethany, Oklahoma Co.; CA **$147,703**, est. $196,714 grade, drain 3.057 mi. US 66 east of Yukon, Canadian Co.;

Okla.—**Elliott Bros.**, Perry, Okla., CA **$75,617**, est. $84,566, asph. stabil. base with single bit. surf. 1.398 mi. Hy. 51 at Skeleton Creek Bridge, Kingfisher Co.;

Okla.—**Frix & Foster**, 1200 S. Cherokee St., Muskogee, Okla., CA **$585,858**, est. $712,881, grade, drain 3.073 mi. and bridge, US 66 bypass in Tulsa, Tulsa Co.;

Okla.—**Mark Holloway**, 5144 N. Brookline St., Oklahoma City 14, Okla., CA **$82,778**, est. $83,139, b. conc. resurf. 2.994 mi. US 77-H from Robinson St. north in Norman, Cleveland Co.;

Okla.—**W. E. Logan & Sons**, Barnes Bldg., Muskogee, Okla. CA **$118,832**, est. $126,489, grade, drain 1.268 mi. US 271 north and east of Talihina, Leflore Co.; CA **$104,697**, est. $113,813, grade, drain 1.276 mi. US 271, east of Talihina, Leflore Co.; CA **$354,520**, est. $338,627, grade, drain 2.622 mi. US 271, east of Talihina, Leflore Co.; CA **$386,685**, est. $447,594, grade, drain 7.918 mi. US 76 south of Tulsa county line, at Beggs, Okmulgee Co.;

Okla.—**Smith Bros.**, Noble, Okla., CA **$113,605**, est. $120,260, grade, drain 5.065 mi. Hy. 31, west of Kinta, Haskell Co.; CA **$95,921**, est. $106,891, b. conc. surf. 2 mi. US 281 at Cimarron River Bridge near Waynoka, Woods Co.;

Okla.—**W. E. Steelman**, 2800 N.E. 4 St., Oklahoma City, Okla., CA **$107,873**, est. $108,001, b. conc. resurf. 2.128 mi. Hy. 33 in Guthrie, Logan Co. Grand total $2,892,071. Bids July 10. CD 6/28.

▲† **Ponsford Bros.**, Box 1412, El Paso, Tex., LB **$1,247,329**, facilities for 6 battalion motor parks, Branch post excange, Inv. ENG-29-005-56-80. Fort Bliss, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids June 25.

† **Lufkin Constr. Co., Inc.**, Box 717, Lufkin, Tex. LB **$610,646**. hydrant refueling facilities, Walker Air Force Base, ENG-29-005-56-102, ROSWELL, N. M. U. S. Eng., Box 1538, Albuquerque, N. M. Bids June 28. CD 5/18.

BUILDINGS—LB & CA

Farmers Union Grain Terminal Assn., M. W. Thatcher, mgr., Snelling and Larpenteur Aves., St. Paul, Minn. Separate Contracts. **$600,000**. 3 story 25,000 sq. ft. OFFICE addn., FALCON HEIGHTS (P.O. ST. PAUL), MINN. CD 7/13.

Watson Constr. Co., Baker Bldg., Minneapolis, Minn. CA **$947,800**. general constr., second unit, Northeast JUNIOR HIGH SCHOOL between 29 and 30 Aves. N.E. and between Hayes and Garfield Sts., MINNEAPOLIS, MINN. Bd. Educ., G. R. Arneson, city purch. agt., 301 City Hall, Minneapolis, Minn. CD 6/13.

▲† **General Services Admin.**, 2306 E. Bannister Rd., Kansas City, Mo., cancelled bids to have been opened June 19, POST OFFICE, COURT HOUSE, COUNCIL BLUFFS, IOWA. Est. **$1,630,000**. CD 5/23.

Contemporary Homes, Inc., 9220 Lackland Rd., Overland 14, Mo. Owner Builds. **$700,000**. 76 brick, concrete RESIDENCES in Sect. V of Robinwood Subdivision, vicinity of Derhake and Washington Rds., FLORISSANT, MO.

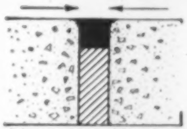
▲ **Beri Goldberg Co.**, 18 S. McKnight Rd., St. Louis 24, Mo. Owner Builds. **$1,500,000**. 76 ranch HOMES in Ladue Estates adjacent to Ladue and Mosley Rds., LADUE (ST. LOUIS 24 P.O.), MO. CD 4/23/54.

PAVEMENT JOINTS
Stay Sealed-

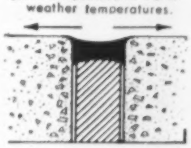
when you specify and use SERVICISED hot-poured PARA-PLASTIC®

★ Keeps joints sealed under severest conditions of Traffic and Temperature

★ Pumped directly into joint from melting kettle



Joint compressed in warm weather temperatures.



Joint opened in sub-zero temperatures.

Hot poured Para-Plastic is the *original* hot poured rubberized asphalt joint sealing compound. It forms a resilient, adhesive and effective plastic which maintains bond at sub-zero temperatures. Superior characteristics of adhesion and cohesion, together with its stability under extremes of temperature make hot poured Para-Plastic the most effective, joint sealing material available.

JET FUEL RESISTANT TYPE

Servicised hot poured Para-Plastic JF is a specially compounded material with all the stability, plasticity and sealing characteristics of regular Para-Plastic, and in addition is unaffected by jet fuel and solvents. It is used for sealing pavement joints on airport runways, taxi strips and aircraft parking aprons.

PARA-PLASTIC SEALING STRIPS

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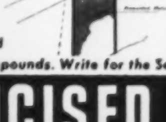
For sealing keyed construction or contraction joints in vertical walls. Maintains bond with concrete at temperatures to sub-zero. Simple installation insures a moisture-tight seal of the joint.

Keyed construction joints in vertical walls and horizontal slabs.

Molded Para-Plastic sealing at a footing.

Para-Lateral Strip



Designed for sealing against seepage in vertical construction and contraction joints in foundation walls, retaining walls, tunnels, abutments, wing walls where back filling against one side of the structure is required.

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SERVICISED PRODUCTS CORPORATION
6051 WEST 65th STREET • CHICAGO 38, ILLINOIS

Dickie Constr. Co., 317 N. 11 St., St. Louis 1, Mo. LB **$531,392,** est. $500,000. 2 story, bsmnt., 140x80 ft. brick, steel, concrete LIBRARY annex and 40x140 ft. GARAGE, 17 and Locust Sts., ST. LOUIS, MO. St. Louis Public Library, Jacob W. Lashly, pres. Library Bd., 13 and Olive Sts., St. Louis 3, Mo. Joseph H. Senne, 2600 Woodson Rd., Overland 14, Mo., archt. Bids July 6. CD 3/23.

Lavender Constr. Co., Texarkana, Tex., CA **$505,532,** general constr. steam POWER PLANT, University of Arkansas, FAYETTEVILLE, ARK. University of Arkansas, Fayetteville, Ark. Bids May 31. CD 6/20, under LB.

▲ **MacDonald Eng. Co.,** 22 W. Madison St., Chicago, Ill. CA general constr. and in charge of general layout, cement PLANT expansion, HUMBOLDT, KAN. Total est. cost **$6,500,000.** Monarch Cement Co., Humboldt, Kan. Servis-Van Doren & Hazard, 2910 Topeka St., Topeka, Kan., consult. engrs. MacDonald Eng. Co., 22 W. Madison St., Chicago, Ill., engr. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. power plant planning;
M. K. Eby Constr. Co., 610 N. Main St., Wichita, Kan. CA general constr. for bldgs. (Humboldt, Kan.);
Jones Bros. Constr. Co., 1109 Byers St., Joplin, Mo. CA power plant (Humboldt, Kan.);
Carrothers Constr. Co., Paola, Kan. CA shale plant (Humboldt, Kan.);
Chalmers & Barton, Hutchinson, Kan. CA raw materials silos (Humboldt, Kan.).

General Electric Co., River Rd., Schenectady, N. Y. CA **$917,000,** furnish, install 22,000-kw turbo-generator unit for POWER PLANT, BRYAN, TEX. City, Bryan, Tex. CD 6/20.

† **Pittsburgh-Des Moines Steel Co.,** Neville Island, Pittsburgh, Pa., CA **$544,400,** five receivers for Naval Ordnance Aerophysics Laboratory, NBy 1188, Spec. 1188/56, DAINGERFIELD, TEX. Bureau Yards & Docks, Dpt. Navy, 8th Naval Dist., Bldg. 16, U. S. Naval Station, New Orleans (Algiers), La. Bids June 21. CD 7/2, under LB.

▲ **J. P. Green,** Box 1947, Dallas, Tex., CA **$1,992,000.** Justin K. Kimball HIGH SCHOOL, DALLAS, TEX. Dallas Independent School Dist., 3700 Ross St., Dallas, Tex. Bids June 26. CD 7/6, under LB.

▲ **Texas Gulf Constr. Co.,** Box 661, Houston 1, Tex. CA **$1,909,185.** Federal Reserve Bank Branch OFFICE, HOUSTON, TEX. Federal Reserve Bank of Dallas, 400 S. Akard St., Dallas, Tex. Bids May 31. CD 6/11, under LB.

▲ **Robert H. Smith & Co.,** 1915 Kolfahl St., Houston, Tex., CA **$2,532,000,** est. $2,500,000. 2 story, masonry Garden Villas SENIOR HIGH SCHOOL, Garden Villas-Foster Pl., HOUSTON, TEX. Houston Independent School Dist., 1300 Capitol St., Houston, Tex. Bids June 27. CD 6/12.

▲ **Ebasco Services, Inc.,** 2 Rector St., New York, N. Y., CA Est. **$22,000,000.** design and construct POWER PLANT and transmission lines, GLENROCK, WYO. Pacific Power & Light Co., 920 S.W. 6 Ave., Portland 4, Ore. CD 2/9.

▲ **Western Knapp Engineering Co.,** 760 Folsom St., San Francisco, Calif., CA Est. **$2,000,000.** design and construct URANIUM MILL, BEDROCK, COLO. Atomic Fuel Extraction Corp., 230 Pitkin St., Grand Junction, Colo.

FAR WEST

BUILDINGS—SLC

▲ **Calif., Clovis**—SHOPPING CENTER—Clovis Shopping Center, c/o H. Schroder, archt., Mason Bldg., Fresno, soon lets contract 1 story, 86,000 sq. ft. shopping center. $1,250,000. CD 5/23.

HEAVY CONSTRUCTION—LB & CA

▲ **NEVADA**—Dpt. Hys., State Office Bldg., Carson City, Nev.—**Hoops Constr. Co.,** Box 431, Twin Falls, Idaho, CA **$514,858,** (4 bidders) constr. portion State Hy. Sys., from junct. FAS 579 (near Smither's Creek) to 14½ mi. northerly in Ruby Valley, FAS Rte 580, Control Sect. EL-45. Proj. S-580 (1), Elko Co.; CA **$83,548** (4 bidders) constr. portion State Hy. Sys., between 24 mi. north and 36 mi. north of junction US Rte. 50 (15 mi. southeast of Eureka), FAS Rte. 578, Control Sect. WP-30. Proj. S-578 (6), State Hy. Contr. 963. White Pine Co.;
Nev.—**Isbell Constr. Co.,** S. Virginia Rd., Reno, Nev. CA **$409,301** (4 bidders) constr. portion State Hy. Sys. from 1 mi. north of the Nye-Mineral Co. Line to junct. US Rte. 50, Control Sects. MI-14 and CH-27, Rte. Sect. FAS 661, Proj. S-661 (2), Mineral and Churchill Counties. Grand total $1,007,697. Bids July 5. CD 6/26.

▲ **WASHINGTON**—State Hy. Comn., Olympia,
Wash.—**Asphalt Paving & Engr. Co.,** Lakeview, Wash., LB **$75,930** (2 bidders) surf. Type I-1 b. conc. 1.547 mi. Secondary St. Hy. 5-E, Puyallup east, Pierce Co.;
Wash.—**J. N. Conley,** 8919 S. E. Foster Rd., Portland, Ore., LB **$251,327** (3 bidders) surf., cement-treated base, Type I-1 b. conc. paving, install illumination sys. 0.993 mi. Primary St. Hy. 12 Cowlitz River Bridge to Jct. Primary St. Hy. 1, FAP U 004-2 (10), Cowlitz Co.;
Wash.—**Curtis Constr. Co.,** N 1401 Fancher Way, Spokane, Wash., LB **$80,288** (2 bidders) light bit. surf., stockpiling crushed cover stone and maint. rock 7.16 mi. Primary St. Hy. 16, Winthrop west, Okanogan Co.;
Wash.—**K. Goulter & Sons,** 3419 16 Ave. W., Seattle, Wash., LB **$868,375** (7 bidders) light bit. surf., cement-treated base, Type I-1 b. conc. paving, install illumination sys. 4.522 mi. Primary St. Hy. 14, Bethel to Sinclair Inlet. FAP No. F-009-1 (5), Kitsap Co.;
Wash.—**J. A. Jussel,** Bellingham, Wash., LB **$92,860** (5 bidders) crushed stone surf. 0.833 mi. Pioneer Parkway, FAS No. S-0314 (3), Skagit Co.;
Wash.—**Northwest Constr. Co.,** 3950 6 Ave. N. W., Seattle, Wash., CA **$231,513** (2 bidders) surf., paving with c. conc. and Type I-1 b. conc. 2.695 mi. Military Rd., FAS No. S-0381 (3), King Co.;
Wash.—**D. A. Sullivan,** Parkwater, Wash., LB **$83,289** (2 bidders) light bit. surf. 2.873 mi. Spangle-Waverly Rd., FAS No. S-0374 (2), Spokane Co. Bids July 10. CD 6/28.

▲† **McCormack Constr. Co.,** Pendleton, Ore., LB **$1,128,113,** est. $1,190,575 (5 bidders) S.M. installation, Inv. 56-66, BAKER, ORE. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids July 13.

† **Clifford C. Boug,** 123 N. 3 Ave., Arcadia, Calif. LB **$793,316,** est. $1,000,000 (8 bidders) Los Angeles River Imprvt., Randolph St. to Florence Ave., Bell, Los Angeles Co., CIVENG-04-353-56-72, CALIFORNIA. U. S. Eng. 751 S. Figueroa St., Los Angeles, Calif. Bids July 10. CD 7/3.

▲† **Price-McNemar,** 8601 Sepulveda Blvd., Sepulveda, Calif. CA **$1,299,570.** NIKE station, admin. bldg., mess hall, barracks, etc., near San Rafael, ENG-56-22, CALIFORNIA. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. CD 6/29, under LB.

BUILDINGS—LB & CA

Albert Vik & Son, 160 Madison St., Eugene, Ore. LB **$558,360.** (5 bidders) JUNIOR HIGH SCHOOL, EUGENE, ORE. Eugene School Dist., 275 7th Ave., Eugene, Ore. Bids July 6. CD 6/20.

▲ **Culligan Development Co.,** c/o treas., 3700 S. El Camino Real, San Mateo, Calif. Owner Builds. **$5,000,000.** subdivision and SHOPPING CENTER, 510-acre site; 5 mi. south of San Jose, in Almaden Golf Course area, ALMADEN, CALIF.

▲ **The William Simpson Constr. Co.,** 2401 Beverly Blvd., Los Angeles, Calif. CA **$5,000,000-$6,000,000.** addnl. facilities, 10 story bldg., at Television City, Beverly Blvd. and Fairfax Ave., LOS ANGELES, CALIF. Columbia Broadcasting System, Inc., 7800 Beverly Blvd., Los Angeles, Calif. Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, Calif., archts.

Noyes-Roach Co., 5017 Telegraph Rd., Los Angeles, CALIF. CA **$608,000,** concrete SHOP BLDG., MONTEBELLO, CALIF. Axelson Mfg. Co., 7701 Telegraph Rd., Montebello, Calif. CD 7/30/51.

† **Stolte, Inc.,** 8451 San Leandro St., Oakland, Calif., CA **$582,040.** 3 story, masonry 36,000 sq. ft., ACADEMIC BLDG., ENG-56-605, PRESIDIO OF MONTEREY, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Awarded July 5.

Highland Village Five, Inc., 2639 S. LaCienega Blvd., Los Angeles, Calif. Owner Builds. **$575,000.** 50 frame, stucco DWELLINGS, Pritchard St., Sunset Ave., etc., PUENTE, CALIF.

Cal-Central Constr. Co., 7500 14 Ave., Sacramento, Calif. LB **$678,913** (5 bidders) general constr. 1 story, part bsmnt., 60,400 sq. ft. recin.-con. RESEARCH HEADQUARTERS, State Div. Hys., SACRAMENTO, CALIF. State Div. Archt., 1120 N St., Sacramento, Calif. Bids July 10. CD 6/12.

▲ **San Francisco Bay Area Longshoremen's Memorial Assn.,** Pier 18, San Francisco, Calif., bid withdrawn, 2 story OFFICE, incl. dispatch hall and auditorium, SAN FRANCISCO, CALIF. LB **$1,046,961.** Will re-advertise. CD 5/18, under LB.

CANADA

BUILDINGS—BA

N. S., Sydney—PROVINICAL—BA 7/30—Dpt. Hys., Province Bldg., Halifax, 3 story, 39x164 ft., brick on steel frame provincial bldg. $500,000. Plans deposit $75. D. F. Sexton, c/o owner, ch. archt. CD 6/21.

▲ **Ont., Toronto**—HOUSING—BA 8/2—Central Mortgage & Housing Corp., 40 Eglinton St. E., Regent Park South Housing, general contract three 14 story, high-rise, rein.-con. apartments. $10,000,000. Plans deposit $100. Separate mechanical, electrical bids 8/3. Page & Steele, 72 St. Clair Ave. W., archts. H. I. Stricker, c/o owner, regional engr. CD 7/27/53.

▲ **Que., Montreal**—FEDERAL—BA 8/29—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., federal bldg. $6,000,000. Lawson & Betts, 660 St. Catherine St. W., Montreal, archts., Brouillet & Carmel, 3600 Barclay Ave., engrs. CD 2/3.

HEAVY CONSTRUCTION—LB & CA

▲ **BRITISH COLUMBIA**—Dpt. P. Wks., Hunter Bldg., Ottawa, ont.
B. C.—**Premier Constr. Co., Ltd.,** 1446 Alberni St., Vancouver, B. C., LB **$517,152** grading, provision of culverts, base course, prime coat Mile 37 to Mile 44, Banff-Windermere Hy., Kootenay National Park, Radium Hot Springs (9-56); LB **$599,695,** grading, provision of culverts, base course, prime coat Mile 23 to Mile 37, Banff-Windermere Hy., Kootenay National Park, Radium Hot Springs (10-56);
B. C.—**Poole Constr. Co., Ltd.,** 10503, 109th St., Edmonton, Alta., LB **$1,485,805,** grading, culverts, base course, bit. prime coat, Mile 10 to Mile 16, Trans-Canada Hy., Yoho National Park, Field.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto,
Warren Bituminous Paving Co. Ltd., 1454 Bloor St. W., Toronto, Ont., CA **$633,542** (3 bidders) hot mix paving Queen Elizabeth Way, Geneva St. intersection in St. Catharines, Contr. 56-74, Hamilton. Awarded July 6.

▲ **Dutton-Williams Bros., Ltd.,** Pacific Bldg., Calgary, Alta., CA, Est. **$60,000,000.** 800-mi. petroleum products pipe line from Alberta to Fort William, Ont., 6 and 8 in. pipe line ONTARIO, MANITOBA, SASKATCHEWAN AND ALBERTA. Canadian Hydrocarbons Ltd., 265 Notre Dame Ave. W., Winnipeg, Man. A. D. Little & Co., 30 Memorial Dr., Boston, Mass., U.S.A., engrs. Awarded July 6. Work to start in 1957.

BUILDINGS—LB & CA

Silverton Constr. Co., Ltd., 257 Yonge Blvd., Toronto, Ont. Owner Builds. **$576,000,** 9 story, 55x120 ft. bsmnt parking, APARTMENT, 319 Sherbourne St., TORONTO, ONT. T. W. Beddall, 514 Jarvis St., Toronto, Ont., archt. Zurich Consultants, Ltd., 8 Bedford Rd., Toronto, Ont. engrs. CD 3/30/55.

PROPOSED PROJECTS

SEWERS, WASTE DISPOSAL

▲ **Conn., Groton**—Town, town-wide sewerage system. **$1,000,000.** Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs.

▲ **Mich., Flint**—City, Harry K. Cull, clk., **$2,500,000** bond election Aug. 7, storm and sanitary sewers. CD 2/17.

▲ **N. J., Hackensack**—Bergen County Sewer Auth., 66 Zabriskie Rd., trunk line to Bergen County Sewer Auth. to cover 19 Hackensack River municipalities now unsewered. **$25,000,000.** Roscoe P. McClave, Admin. Bldg., consult. engr.

▲ **Tex., Garland**—City, sewer plant, **$650,000;** sewer outfall lines, **$1,000,000.** CD 8/18.

BRIDGES

▲ **Mo., St. Louis**—City, Frank J. McDevitt, pres. Bd. P. Service, 304 City Hall, 12 Blvd. and Market Sts., Zone 3, imprv. MacArthur Bridge across Mississippi River between St. Louis, Mo. and East St. Louis, Ill., incl. renewal hy. deck, toll station, service bldg., widen and exten. western approach. **$2,000,000.** C. E. Smith & Co., 1602 Locust St., Zone 3, consult. engrs. CD 6/7/55.

STREETS AND ROADS

▲ **COLORADO**—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Adams Co.—grading, paving 6.6 mi. 4-lane, S.H. 2. Adams City-Barr Lake. IN 003-1 (8), **$550,000.**
paving 6 mi. S.H. 3, E. 46 Ave.-north through Adams City. F 006-1 (18), **$250,000.**

Arapahoe and Douglas Counties—c. conc. pavement and interchanges 13 mi. S.H. 185, Denver-Castle Rock, BIN 002-2 (41), $1,450,000.

Boulder and Larimer Counties—wid'n. resurf., pave 6 mi. S.H. 1, Longmont-North, C 07-0001-09, $350,000.

Cheyenne Co.—stabil. and pave 5 mi. S.H. 51, north of Cheyenne Wells. S 0001 (25), **$200,000.**
grading, stabil. and pave 5 mi. S.H. 8, Boyero-Wild Horse, F 017-3 (5), **$275,000.**

Costilla Co.—grade, pave 9 mi. S.H. 10, Ft. Garland-Russel. F 022-3 (2), **$500,000.**

Denver Co.—grade, str. and paving 1.5 mi. St. Hy. 185, Valley Hy., Denver. UI 001 (17), **$3,000,000,** CD 7/12/54.
grading, structures, paving 1 mi. W. 6th Ave., S.H. 182. Denver, BU 012-2 (1), **$830,000.**

Eagle Co.—realign and 3-lane 5 mi. S.H. 78, Westside Vail Pass, BF-012-1 (3), **$500,000.**

Elbert Co.—grading, drain, pave 18.5 mi. S.H. 8, Agate-River Bend, IN 005-4 (7), **$1,500,000.**

El Paso Co.—stabil. and plant mix 13 mi. S.H. 1, Colo. Springs-Fountain. IN 002-2 (42), **$850,000.**
10 mi. 4-lane constr. S.H. 1, Fountain-South. IN 002-2 (39), **$700,000.**
3 mi. rebuild old 2-lane on S.H. 1, south of monument, IN 002-2 (40), **$150,000.**

El Paso and Teller Counties—stabil. and pave 4 mi. S.H. 4, Green Mountain Falls-Woodland Park. F 017-1 (1), **$175,000.**

Huerfano Co.—stabil., pave 5 mi. S.H. 1. Herfano River-Walsenburg. FI 002-3 (17), **$400,000.**

Jefferson Co.—stabil. and pave 1.5 mi. S.H. 58, Wheatridge W. 44-Sheridan to Wadsworth, **$150,000.**
stabil., wid'n., pave S.H. 2, W. Colfax-Sheridan to Simms, F 005-3 (12), **$720,000.**

Jefferson and Park Counties—grading, drain, pave 8 mi. 3-lane hills on S.H. 8, Conifer-southwest. F 018-1 (5), **$750,000.**

Kiowa Co.—stabil. and pave 6 mi. S.H. 59. Eads-North. F 028-1 (2), **$250,000.**

LaPlata Co.—grade, drain, pave 3.5 mi. S.H. 10, Bayfield-west. BF 022-2 (12), **$350,000.**

Logan Co.—9 mi. constr., bridges and pave S.H. 14, Sterling-east. F 010-1 (2), **$500,000.**

Mesa Co.—wid'n. and pave 2.5 mi. S.H. 4, DeBeque Canon. F 001-1 (15), **$330,000.**
constr. and pave 1.5 mi. S.H. 20, Grand Junction-northwest. F 001-1 (12), **$375,000.**
grade, stabil. and pave 4.7 mi. S.H. 6, Delta-Grand Junction, F 019-1 (4) 1 (5), **$500,000.**

Moffat Co.—realign, pave 6 mi. S.H. 2, Craig-west. F 005-1 (2), **$500,000.**

Montezuma Co.—grade, drain, pave 3.5 mi. S.H. 106, Cortez-south, F 023-1 (3), **$350,000.**

Otero Co.—5 mi. 4-lane on S.H. 6, Rockyford-Swink, F 001-4 (3), **$800,000.**

Prowers Co.—stabil. and pave 6 mi. S.H. 6-59. Alamar-Wiley Jct. F 001-5 (6), **$220,000.**

Pueblo Co.—grade, structures and pave 1.5 mi. S.H. 1 (Pueblo Freeway) Pueblo, BIN 002-3 (18), **$800,000.**

Rio Blanco Co.—stabil., pave 6 mi. S.H. 13, Jct. S.H. 64-Meeker, BF 018-1 (10), **$400,000.**

Routt Co.—stabil. 6 mi., 3-lane hills and pave S.H. 2, Rabbit Ears Pass, F 005-2 (12), **$700,000.**

Saguache Co.—3.5 mi. constr. and pave S.H. 114, Cochetopa Pass, FASP. S 0124 (8), **$200,000.**

San Juan Co.—grade, drain, pave 4 mi. S.H. 19, Lime Creek-Molas Pass, BF 019-2 (7), **$550,000.**

Weld Co.—7.5 mi., 4-lane constr. S.H. 3, Gilcrest north and south, F 006-1 (17), **$750,000.**

Washington and Yuma Counties—constr. bridge and pave, 8 mi. S.H. 102, Cope-Joes, F 013-1 (2), **$600,000.**

Yuma Co.—constr., pave 8.5 mi. S.H. 54, Yuma-West, F 011-1 (6), **$350,000.** Mark U. Watrous, c/o owner, state hy. engr.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford.

Hartford Co.—Hartford-Springfield Expressway between end of present constr. at Rte. 75 to Rte. 5-A, Windsor and Windsor Locks, **$5,000,000.** Goodkind & O'Dea, 39 Lackawanna Place, Bloomfield, N. J., consult. engrs.

Hartford-Springfield Expresway from Rte. 5-A across Conn. River to Enfield, Enfield and Windsor Locks, **$7,000,000,** Brown & Blauvelt, 468 Fourth Ave., New York, N. Y., consult. engrs.

Hartford-Springfield Expressway from east end of Conn. River Bridge to Mass. State Line, Enfield, **$4,400,000,** Hayden, Harding & Buchanan, Park Square Bldg., Boston, Mass., consult. engrs.

Bradley Field connector for Hartford-Springfield Expressway, Windsor Locks, **$3,600,000.** Loomis & Sullivan, 641 Farmington Ave., Hartford, consult. engrs.

▲ **Mich., Flint**—City, Harry K. Cull, clk., bond election Aug. 7, paving, wid'n. streets, **$1,070,000.** CD 2/17.

EARTHWORK, WATERWAYS

▲† **New Jersey and Pennsylvania**—U. S. Eng., Federal Bldg., Phila., Pa., dredging 25 ft. channel in Delaware between city of Beverly, N. J. and Tacony, Pa., Burlington Co., N. J. **$4,500,000.**

LATIN AMERICA

▲ **Venezuela**—GAS PIPE LINE—Cia Shell de Venezuela, Edificio Shell, San Bernardino, Caracas, D. F., plans 177 mi. 20 in. gas pipe line from Cardon refinery to LaPaz Field. **$19,500,000.**

AMERICANS ABROAD

▲ **Pakistan**—Govt. of Pakistan, Karachi, plans multipurpose dam in Karnafuli River, on Bay of Bengal near Chittagong, East Pakistan. **$68,000,000.** International Engineering Co., 74 New Montgomery St., San Francisco, Calif., U.S.A., consult. engr.

FOREIGN

▲ **Greece, Ptelemais**—FERTILIZER PLANT—Govt. of Greece, Athens, plans 70,000 tons annual capacity nitrogenous fertilizer plant, **$25,000,000.**

▲ **Japan**—Kansai Electric Power Co., Tokyo, plans power dam on Kurobe River in Tateyama. **$100,000,000.** Company is negotiating with Guy F. Atkinson Co., P. O. Box 593, South San Francisco, Calif., U. S. A. for technical assistance.

PUBLIC BUILDINGS

▲ **Calif., Lancaster**—SCHOOLS—Antelope Valley Union High School Dist., 44900 North Division St., voted **$4,000,000** bonds May 18, schools. CD 2/24.

▲ **Calif., Lynwood**—SCHOOLS—Lynwood Unified School Dist., Lynwood, bond election Oct. 16, high school, **$1,370,000;** elementary school, **$935,000.** CD 2/15/55.

▲ **Calif., Sonora**—SCHOOLS—Sonora Union High School Dist., Sonora, defeated bonds June 12, high school addns. **$1,250,000.** CD 5/3.

▲ **Conn., Guilford**—HIGH SCHOOL, etc.—Town, high school, New England Rd., **$1,000,000;** elementary school, Maupas Rd., **$500,000.**

▲ **Conn., New Haven**—WOODRUFF CENTER—State Pub. Wks. Dpt., 165 Capitol Ave., Hartford, plans by Henry F. Ludorf, 95 Elm St., Hartford, Woodruff Center, 1418 Chapel St. **$3,200,000.** CD 5/10.

▲ **Fla., Orlando**—COURT HOUSE—Bd. Comrs. Orange Co., Court House, plans by James B. King, 318 W. Colonial Dr., Orlando, and James Gamble Rogers II, assoc. archt., 145 Lincoln Ave., Winter Park, 14 story annex to Orange County Court House. **$1,500,000.**

▲ **Md., Baltimore**—SCHOOL—City, Bureau Bldg. Constr. 410 Municipal Bldg., Zone 2, plans by Lucius R. White, Jr., 1009 N. Calver St., masonry Senior High School on city hospital grounds, **$3,000,000.** McNeill & Baldwin, 1025 St. Paul St., Zone 2, mech. engrs. V. R. P. Saxe, 1701 St. Paul St., Zone 2, struct. engr. CD 4/25/55.

▲ **Md., Baltimore**—STUDENT UNION—University of Maryland, Lombard and Greene Sts., Zone 1, plans by Lucius R. White, Jr., 1009 N. Calvert St., Zone 2, brick, concrete, steel student union bldg. **$1,000,000.** Egli & Gompf, 1019 N. Calvert St., Zone 2, mech. engrs. V. R. P. Saxe, 1701 St. Paul St., Zone 2, struct. engr. CD 2/7/55.

▲ **Mich., Battle Creek**—SCHOOL—Bd. Educ., Harper Creek School Dist., high school, Harper Creek, **$1,000,000.**

▲ **Mich., Kalamazoo**—SCHOOL—Kalamazoo School Dist., 306 F. Lovell St., plans by Eberle M. Smith Assoc., Inc., 153 E. Elizabeth St., Detroit, Junior High School, northwest section of city. **$1,972,614.** Henry B. Christensen, 306 E. Lovell St., engr.

▲ **Mich., Lansing**—COURT—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., plans by Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, Zone 26, supreme court. **$2,500,000.** CD 5/27/55.

▲ **Mich., Lansing**—OFFICE—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., plans by Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, Zone 26, 14 story office with 3 story annex for library. **$10,840,000.** CD 5/27/55.

▲ **Mich., Chelsea**—SCHOOL—Bd. Educ., Chelsea School Dist., Howard Flintoft, secy., plans by Louis C. Kingscott, 511 Monroe St., Kalamazoo, high school. **$2,000,000.**

▲ **Mich., Fline**—HOSPITAL—City, Harry K. Cull, clk., bond election Aug. 7, Hurley Hospital completion. **$1,500,000.**

▲ **Mich., Travers City**—SCHOOLS—City, Bd. Educ., 2 elementary schools, addns. to existing grade schools. **$1,300,000.** CD 3/20.

▲ **N. J., Lambertville**—SCHOOL—Lambertville Regional Bd. Educ., Lambertville, regional high school for Lambertville, West Amwell and Stockton, **$1,000,000.**

▲ **N. J., North Bergen**—HOUSING—Housing Auth. of Twp. of North Bergen, plans by Ricker & Axt, 6115 Hudson Ave., West New York, 200 unit housing, western sect. of twp. near 63 St., north of Meadowview project. **$2,200,000.**

▲ **N. J., Point Pleasant**—SCHOOL—Brick Twp. Bd. Educ., plans by Micklewright & Mountford, Prospect and E. Stuyvesant Aves., Trenton, Junior-Senior High School. **$1,600,000.** Bond issue referendum Sept. 19. CD 12/5.

▲ **N. J., Union City**—HOUSING—Union City Housing Auth., 3715 Palisade Ave., plans by B. H. Whinston, 780 Third Ave., New York 17, N. Y., 5,000 unit housing, incl. 21 bldgs., shopping center on tract bounded by Paterson Plank Rd., Central Ave., Ninth St., Palisade Ave. and Hoboken-Lincoln Tunnel Rd., **$30,000,000.** Greenhut & Taffel, 2 Columbus Circle, New York 19, N. Y., engrs. CD 10/18/49.

▲ **N. Y., Rochester**—OFFICE, etc.—City of Rochester, and Monroe Co., City Hall, plans by Faragher & Macomber, 900 Powers Bldg., and Voorhees, Walker, Smith & Smith, 101 Park Ave., New York, 19 story office, court house, underground garage and central plaza. **$43,000,000.** CD 3/5/47.

▲ **O., Flushing**—HIGH SCHOOL—Bd. Educ. Union Dist., Flushing, bond election Nov. 6, high school; repairs and imprvs. at Belmont, Bethesda, Holloway, Centerville and Morristown Schools. **$1,115,000.**

▲ **O., Wapakoneta**—HIGH SCHOOL—Bd. Educ., Wapakoneta, bond election Nov. 6, high school. **$1,300,000.** Sullivan-Isaacs-Sullivan & Assoc., 1800 Reading Rd., Reading, archts.-consult. engrs. CD 4/7/54.

▲ **O., Warren**—BUILDING—Comrs. Trumbull Co., Court House, bond election Nov. 6, county administration bldg. **$1,800,000.** CD 11/11.

▲ **Pa., Beaver Falls**—SCHOOL—School Dist. Plans by Frank J. Dickerson, 1902 7th Ave., 2 story, brick, steel elementary school, 11th St. and 5th Ave. **$1,000,000.**

▲ **Pa., Phila.**—SCHOOLS—Bd. Educ., 21 and Winter Sts., high school and elementary school in Bustleton District, **$3,000,000;** plans by Matthew B. Ehrlich & Ezekiel Levinson, 1 N. 13 St., elementary school, 16 St. and Columbia Ave., **$2,500,000.**

▲ **Pa., Phila.**—SCHOOL—Bd. Educ., 21 and Winter Sts., plans by Thalheimer & Weitz, 1325 Walnut St., Benjamin Franklin Senior High School. **$4,000,000.** Stewart G. Barnett, 505 Cooper St., Camden, N. J., consult. engrs. Bids in September. CD 7/2/54.

▲ **Tex., San Angelo**—AUDITORIUM-COLISEUM—City, City Hall, voted bonds June 30, civic auditorium and stock show coliseum, **$1,000,000.** CD 6/13.

▲ **Va., Princess Anne**—SCHOOLS—Princess Anne Co., Court House, voted **$3,300,000** bonds July 10, school constr. CD 6/14.

▲ **Wash., Seattle**—SCHOOL—School Dist. No. 1, 815 4 Ave. N., North End High School, 1 Ave. N.E. and E. 125 St. **$2,800,000.** Work will probably not begin before 1958. CD 3/15/54.

▲ **Wis., Milwaukee**—SCHOOLS—Bd. Educ., 1111 N. 10 St., plans by Eschweiler & Eschweiler, 720 E. Mason St., Junior High School, N. 71 St. and W. Silver Spring Dr., **$2,000,000;** plans by Ebbing, Plunkett & Keymar, 1220 N. Milwaukee St., Zone 2, Alexander Graham Bell Junior High School, **$2,000,000;** plans by Lindl-Schutte & Assocs., 808 N. 3 St., Milwaukee, Zone 3, addn. to and remodel Junior High School, W. Windlake Ave., **$400,000.**

▲ **B. C., Vancouver**—CIVIC CONCERT HALL-AUDITORIUM—City, City Hall, plans by R. T. Affleck & Assocs., 5060 Western Ave., Montreal, Que., civic concert hall and auditorium. **$3,000,000.** T. P. Keith & Assocs., 4935 Clanranald Ave., Montreal, Que., consult. engrs. Bids in early August. CD 6/9/55.

▲ **Ont., Chatham**—SCHOOL—Bd. Educ., Harrison Hall, Chatham, plans by Dunlop Moore Assocs., archts.-consult. engrs., 3341A Bloor St. W., Toronto, Junior composite school. **$1,350,900.** CD 1/30.

COMMERCIAL BUILDINGS

▲ **Ala., Birmingham**—APARTMENT—Marvin R. Engel, 1921 First Ave. N., plans by Charles McCauley, Jackson Bldg., 7 story apartment, Montclair Rd. in Redmont Sect. **$1,000,000.**

▲ **Calif., Stockton**—DORMITORY—College of the Pacific, N. Pacific Ave., plans by Bessell with Clowdsley & Whipple, 142 N. California St., womens dormitory. **$1,400,000.** CD 10/10.

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▲ **Conn., Bloomfield**—SHOPPING CENTER—Green Manor Estates, Inc., 681 Parker St., Manchester, plans by Davis, Brody, Juster & Wisniewski, 220 E. 23 St., New York, N. Y., and Saml. Grody, consult. archt., 137 Ridgefield St., Hartford, regional shopping center, 150,000 sq. ft. parking area, on 41 acre site, Blue Hills and Wintonbury Ave. **$2,500,000**. CD 6/22.

▲ **Conn., Hartford**—DEPARTMENT STORE—G. Fox & Co., 960 Main St., building expansion program. **$6,000,000**.

▲ **Conn., Southington**—HOUSES—Meadowood Homes, South End Rd., 102 houses, Meadowood, South End Rd., **$1,111,800**.

▲ **Ind., Indianapolis**—CHURCH—Second Presbyterian Church, Vermont and Pennsylvania Sts., plans by McGuire & Shook, 1400 Fletcher Bldg., Zone 4, steel, concrete, masonry church, Meridian Hills. **$1,250,000**. J. M. Rotz Eng. Co., 1919 N. Meridian St., consult. engrs. CD 8/31/54.

▲ **Mass., Salem**—REVENUE AND ACCOUNTING—New England Telephone & Telegraph Co., 185 Franklin St., Boston, plans by Cram & Ferguson, 248 Boylston St., Boston, 2 story, 148x202 ft. masonry revenue and accounting bldg. **$1,000,000**.

▲ **Mich., Muskegon**—HOTEL—William A. White & Sons, 51 E. 42 St., New York, N. Y., plans by Michael DeAngelis, 522 Fifth Ave., New York, N. Y., hotel. **$3,000,000**.

▲ **Mo., St. Louis**—OFFICE—Ralston Purina Co., Donald Danforth, chn. bd., 835 S. 8 St., Zone 2, 6 story office, south present main office and also 3 story top addn. to existing bldg. west of proposed new bldg. **$1,500,000**.

▲ **N. J., Beach Haven**—SHOPPING CENTER—J. & H. L. Shapiro, Beach Haven, N. J., shopping center, 60,000 sq. ft. stores area, grading, bulkheading, Beach Haven Park, **$1,000,000**.

▲ **N. Y., Brooklyn**—APARTMENT—Fourth Avenue Management Corp., 350 Lefferts Ave., Zone 25, plans by Oscar I. Silverstone, 666 Fifth Ave., New York, 6 story apartment, 144 unit, and 44-car garage, 414 97 St. **$950,000**.

▲ **N. Y., Buffalo**—SHOPPING CENTER—Grand Island Plaza, Inc., c/o L. A. Grant, Rand Bldg., Buffalo, shopping center on 15 acre site at Grand Island Express Hy. and Baseline Rd. **$2,000,000**.

▲ **N. Y., Buffalo**—HOUSING—Love-Weichman Limited Profit Housing Co., Inc., c/o Donald W. Love, archt., 232 Delaware Ave., 2 story garden apartment housing, for 124 units, **$1,654,000**.

▲ **N. Y., New York**—HOSPITAL—New York University—Bellevue Medical Center, 550 First Ave., Zone 16, plans by Skidmore Owings & Merrill, 575 Madison Ave., Zone 22, alterations to hospital and office, 401-35 E. 30 St., and 516-96 First Ave. **$2,000,000**.

▲ **N. Y., New York**—HOUSING—Park-Reservoir Housing Corp., c/o Abraham Kazan, 570 Grand St., Zone 2, plans by H. J. Jessor, 92 Liberty St., Zone 7, 288 unit apartment co-operative housing, one 12 story bldg., at Orloff and Van Cortlandt Aves. and two 14 story bldgs. near 238 St. between Cannon Pl. and Sedgwick Ave. **$4,503,420**.

▲ **N. Y., New York**—HOUSING—Woodlawn Veterans Mutual Housing Corp., c/o Bernard G. Walpin, 107-48 Queens Blvd., Forest Hills, plans by Max M. Simon, 1841 Broadway, Zone 23, 9 story apartment, 99 unit co-operative housing, Katonah Ave., between 234 St. and 235 St. **$1,717,991**.

▲ **O., Dayton**—MEDICAL AND PROFESSIONAL—B. E. Horn, Towrvw Rd., medical and professional bldg., six to eight floors, for 30 office suites, near Miami Valley Hospital. **$1,000,000**. Site undetermined.

▲ **O., Milford**—SHOPPING CENTER—Gallenstein Bros., 25 Cemetery Rd., plans by Betz & Bankemper, 319 Scott St., Covington, Ky., shopping center, 1,500-car parking, on US 50 between Hodge's Lane and Ohio 131. **$1,500,000**. Bids in fall. Herman Williams, c/o owner, consult. engr. CD 1/18.

▲ **Pa., Braddock**—HOSPITAL—Braddock General Hospital plans by Ingham Boyd & Pratt, Empire Bldg., Pittsburgh, 3 story brick, steel hospital. **$1,000,000**.

▲ **Pa., Levittown**—SCHOOL—R. C. Archdiocese of Phila., 1723 Race St., Phila., plans by Henry Dagit & Sons, 1329 Race St., Phila., masonry high school. **$2,500,000**.

▲ **Tex., Houston**—HOTEL-OFFICE—Glenn McCarthy, 2121 W. Holcombe St., plans by Nunn, Nunn, Ulbricht, 3272 Westheimer St., 17 story hotel-office. **$5,000,000**.

▲ **Tex., Pampa**—HOTEL—Syndicate, George Crea, Jr., chn., Hotel Committee, Pampa, hotel. **$1,000,000**.

▲ **Utah, Salt Lake City**—HOSPITAL—St. Mark's Hospital, Second West 7th North, plans by R. Lloyd Snedaker, 706 Utah Savings & Trust Bldg., hospital addn. **$1,000,000**.

▲ **B. C., Vancouver**—APARTMENT—Rivers Realty Ltd., 4488 Main St., plans by R. C. Bennet & Assocs., 1933 W. Broadway, 15 story apartment, Chester and Burrard Sts. **$2,000,000**. A. B. Sanderson & Co. Ltd., 1105 W. Pender St., Vancouver, consult. engrs.

▲ **Ont., Toronto**—RESIDENCES—Wrentham Estates Ltd., 1489 Bayview Ave., 183 homes, York Mills Gardens, roads, sewer and water services. **$2,000,000**.

▲ **Que., Murdochville**—RESIDENCES—Gaspe Copper Mines, Ltd., c/o Noranda Mines, Ltd., Royal Bank Bldg., Toronto, Ont., plans by Allward & Gouinlock, 57 Bloor St. W., Toronto, Ont. mine residential development, recreation center, incl. bowling alleys, swimming pool, curling and skating rink, 100 dwellings, 60 mi. from Gaspe Village. **$1,000,000**.

INDUSTRIAL BUILDINGS

▲ **Calif., Los Angeles**—PLANT—Air Reduction Pacific Co., 150 E. 42 St., New York 17, N. Y., air liquefaction plant to produce liquid oxygen, liquid nitrogen and liquid argon, **$7,500,000**.

▲ **Calif., Los Angeles**—WAREHOUSE, etc.—Firestone Tire & Rubber Co., 1200 Firestone Blvd., Akron 17, O. plans by Pereira & Luckman, 9220 Sunset Blvd., Los Angeles, 250,000 sq. ft. warehouse, office. **$2,000,000**.

▲ **Calif., Oakland**—PLANT—Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago, Ill., liquid oxygen plant. **$4,000,000**.

▲ **Conn., Hartford**—FACTORY—Fuller Brush Co., 3580 Main St., factory. **$5,000,000**. CD 2/14/51.

▲ **Fla., Miami**—DEPOT—Florida East Coast Ry. Co., L. C. Frohman, ch. engr., St. Augustine, depot, **$633,000**; ramps, passenger shed, tunnels, tracks, paving, site, N. W. 36 St. Total est. **$3,000,000**. CD 11/9/49.

▲ **Ill., Dolton**—PLANT—Container Corp., 38 S. Dearborn St., Chicago, Zone 3, 150,000 sq. ft. paper box plant. **$1,500,000**.

▲ **Ind., Fort Wayne**—PLANT—News Publishing Co., 227 E. Washington St., plans by Naess & Murphy, 80 E. Jackson Blvd., Chicago, Ill., 2 story, rein.-con., steel newspaper plant. **$1,500,000**.

▲ **Ind., Hartford City**—PLANT—Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn., 163,000 sq. ft. paper-coverting plant on tract adjoining Hartford City Paper Co. (owned by Minn. Mining & Mfg. Co.) **$1,000,000**. To go ahead in August.

▲ **Kan., Wichita**—GARAGE—John R. LeBosquet, Union National Bank Bldg., plans by Overend & Boucher, Brown Bldg., Wichita, 125x140 ft. parking garage, 5 levels. **$1,000,000**.

▲ **Minn., St. Paul**—PLANT—Northern States Power Co., 15 S. Fifth St., Minneapolis, plans by Pioneer Service Co., 231 S. LaSalle St., Chicago 4, Ill., sixth unit, 150,000 kw High Bridge generating plant addn. **$24,000,000** (constr. and equip.). CD 7/10.

▲ **Mo., Hazelwood (St. Louis 21 P. O.)**—WAREHOUSE, etc.—Kroger Co., Robert A. Hughes, mgr., 1311 S. 39 St., St. Louis, Zone 10, warehouse, bakery and office, 1 story, dock areas for both trucks and railroad cars, on 63 acre tract U. S. No. 66 adjacent to St. Louis Municipal Airport. **$3,000,000**. Constr. early Fall 1956.

▲ **N. J., Hopewell**—FACTORY-OFFICE—Bristol-Myers, 630 Fifth Ave., New York, N. Y., plans by Chapman, Evans & Delahanty, 50 Broadway, New York, N. Y., factory-office, Scotch Rd. **$1,000,000**.

▲ **N. J., Sayreville**—GENERATOR—Jersey Central Power & Light Co., 98 Summit Ave., Summit, second 137,500 kw generator addn. to Sayreville generating station, **$25,000,000**.

▲ **N. J., Trenton**—PLANT—Curtis-Wright Corp., 30 Rockefeller Plaza, New York 20, N. Y., 500,000 sq. ft. plant for production of jet and turbo-jet engines, Provinceline Rd. near U. S. Rte. 1, Lawrence Twp. **$3,000,000**.

▲ **N. Y. Tonawanda**—INDUSTRIAL CENTER—Frontier Industrial Park, Inc., Francis W. Howe, pres., 1702 Elmwood Ave., Buffalo, 20 bldg. industrial center for light mfg. warehousing, branch offices, etc. on 50 acre site between Colvin Blvd. and Delaware St. on Young St. **$2,500,000**.

▲ **O., Steubenville**—FURNACE—Wheeling Steel Corp., Wheeling Steel Corp. Bg., Wheeling, W. Va., relining and general repairs to blast furnace at Steubenville North Works. **$1,250,000**.

▲ **Virginia**—POWER PLANT—Appalachian Electric Power Co., 40 Franklin Rd., Roanoke, hydro-electric power plant of 60,000 kw capacity on Roanoke River, Smith Mountain. **$20,000,000**. Applied to F.P.C. for permit.

▲ **Alta., Pincher Creek**—SULPHUR PLANT—British American Oil Co. Ltd., 800 Bay St., Toronto, sulphur plant, 13 mi. southeast of here. **$1,000,000**.

▲ **N. B., Bathurst**—PLANT—American Metal Co., 25 Adelaide St. W., Toronto, Ont., lead-zinc-copper smelting plant, near here. **$30,000,000**.

▲ **N. B., Bathurst**—ORE MILL—Brunswick Mining & Smelting Corp., Ltd., 330 Bay St., Toronto, Ont., lead, silver, zinc ore mill, base metal mine development. **$27,000,000**.

▲ **Ont., Sarnia**—PLANT—Imperial Oil Co., 56 Church St., Toronto, petrochemical plant. **$25,000,000**.

▲ **Sask., Moose Jaw**—DISTILLERY—Signet Distilleries, Ltd., 1167 N.W. 2nd St., distillery, 30-acre site near western city limits. **$2,000,000**.

▲ **Sask., Saskatoon**—PLANT—Prairie Fiberboard, Ltd., 255 3rd Ave. S., 1 story, 140x568 ft., steel, brick fiberboard plant, rein.-con. fdn. **$3,000,000**. Stadler, Hurter & Co., 1117 St. Catherine St. W., Montreal, Que., consult. engrs.

UNCLASSIFIED

▲ **Oregon-Washington**—RURAL DISTRIBUTION LINES—Clearwater Power Co., Lewiston, Idaho, extend lines to 120 new customers in Troy-Flora area of Oregon and imprv. facilities in Austin and Whitman Counties, Wash. **$1,660,000**.

▲ **Alaska, Anchorage**—UTILITIES—R. Dow, Anchorage, utilities for college village subdivision, **$1,000,000**.

▲ **Alaska, Edna Bay**—MINING FACILITIES—Edna Bay Pure Stone Co., c/o Kent R. Diebl, Orange, Tex., mining facilities. **$1,000,000**.

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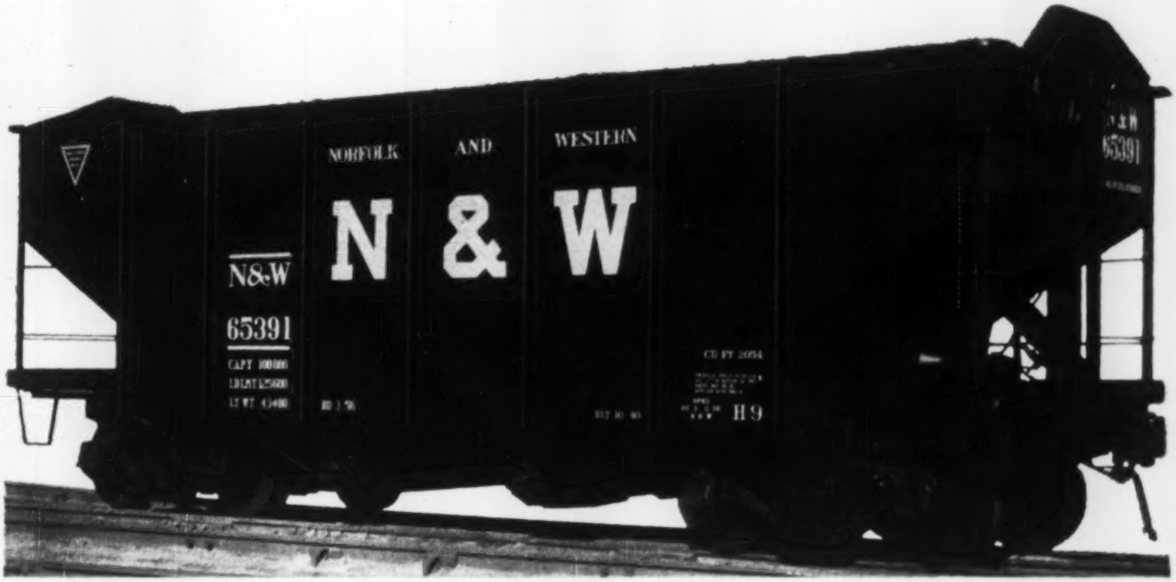

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
July 31, August 14 Massachusetts

† **New Hampshire and Maine**—FACILITIES—BA On Or About 8/14—U. S. Eng., 150 Causeway St., Boston 14, Mass., constr. facilities consisting of generator bldg. and facilities, Fort Dearborn, Portsmouth, N. H.; access road, generator bldg. and facilities at Musquash Mountain, Topsfield, Me.; access road, 3 generator bldgs., facilities, No. 9 Mountain, Bridgewater, Me., ENG-19-016-57-13. $400,000-$500,000. Plans deposit $10.

▲† **Massachusetts**—BA 8/17—U. S. Eng., 150 Causeway St., Boston, constr. Buffumville Dam, etc., Little River, Charleton, CIVENG-19-016-57-2. $1,500,000-$2,000,000. Plans deposit $10, refundable. CD 7/11.

▲† **New Hampshire**—BA On Or About 8/24—U. S. Eng., 150 Causeway St., Boston 14, Mass., Otter Brook Dam and appurtenant structures, Otter Brook, located in city of Keene and town of Roxbury, Cheshire Co., dam will be on Otter Brook 2.4 mi. above its confluence with branch 4.9 mi. above the Ashuelot River, 31.4 mi. from Conn. River, CIVENG-18-016-57-4, $2,500,000-$3,000,000. Plans deposit $10. CD 8/19.

BUILDINGS—BA

Conn., **Stamford**—COURT HOUSE—BA 8/16—Comrs. Fairfield Co., 172 Golden Hill St., Bridgeport, 3 story, red brick with limestone trim county court house, Hoyt St. $765,000. Wm. J. Provoost, 421 Main St., archt. CD 4/4.

▲ **Mass., Boston**—GARAGE—BA 8/23—City, Real Property Bd., City Hall Annex, mechanical off street garage Hayward Place, Harrison Ave. exten. and Norfolk Place. $1,500,000. Plans deposit $100, refundable. William Nelson Jacobs Assoc., Inc., 316 Stuart St., Boston, archt.

BUILDINGS—SLC

Mass., **Norwood**—FACTORY, etc.—Detroit Controls Corp., Providence Hy., soon lets contract factory and office, Airport Rd. $800,000. Korslund, Len Normand & Quann, Inc., 506 Washington St., Norwood, archt.

▲ **Vt., Rutland**—HOSPITAL—Rutland Hospital, Nichols St., Rutland, soon lets contract hospital. $2,000,000. Thomas Farr Allerbe & Co., First Natl. Bank Bldg., St. Paul, Minn., engrs.-archts. Extended date. CD 6/27.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW HAMPSHIRE**—Dpt. P. Wks. & Hys., Concord, N. H.

N. H.—**Campanella & Cardi Constr. Co.**, Hillsgrove, R. I. LB **$1,961,365.** (4 bidders) road mix hy. 3.06 mi. and 3 bridges on Spaulding Turnpike, Rochester;

N. H.—**D. E. Ambrose & Sons,** 34 Main St., Meredith, N. H. LB **$197,484**. surf. tr. grav. 1.249 mi., US 302, Harts Location. Bids July 12.

R. Zoppo, 842 Boston-Providence Hy., Dedham, Mass. LB **$569,000,** est. $600,000. convert Cohituate Aqueduct from water to trunk line sewer, NEWTON, MASS. City, City Hall, Newton, Mass. Bids July 11. CD 6/27.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,

L. G. DeFelice & Son, Inc., Nettleton Ave., North Haven, Conn. CA, **$3,683,493.** Turnpike Proj. 329-01, approx. 36,055 lin. ft. grading, drainage, b. conc. pavement, incl. 6 grade separation structures, 1 bridge over railroad and 1 concrete box culvert, Plainfield. Bids July 2, awarded July 16. CD 7/5, under LB.

▲ **CONNECTICUT**—State Hy. Dpt., 165 Capitol Ave., Hartford,

Conn.—**Lane Constr. Corp.,** 965 E. Main St., Meriden, Conn. LB **$788,627.** (3 bidders), Proj. 75-58, bit. macad. 7.337 lin. ft. Hammonasset Connector, Madison;

Conn.—**Genoerrelli, Inc.,** Oak St., Westerly, R. I. LB **$107,701.** (5 bidders) slope paving 3,871 lin. ft. Maple Ave., Route 154, Old Saybrook;

Conn.—**Brookside Constr. Co.,** 490 Roberts St., East Hartford, Conn. LB **$111,660**. Proj. 159-80, c. conc. 1,253 lin. ft. on-off ramp from Route 15 to Route 9, Wethersfield. Bids July 16. CD 6/29.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,

M. A. Gammino Constr. Co., 728 Valley St., Providence, R. I. and **Brunalli Constr. Co.,** Somers St., Plainville, Conn. CA **$5,269,129**. Proj. 108-69, 27,004 lin. ft. grading, drainage, b. conc. Conn. Turnpike, Killingly and Plainfield; Windham Co.; CA **$5,676,867,** Proj. 328-04, 37,753 lin. ft. grading, drainage, b. conc. Conn. Turnpike, Griswold, Lisbon and Plainfield, New London and Windham Counties. CD 6/27, under LB.

Associated Constr. Co., 1010 Wethersfield Ave., Hartford, Conn., LB **$988,925,** est. $1,200,000, Contr. 1956 town incinerator, north of New Britain Ave., WEST HARTFORD, CONN. Town, Town Hall, West Hartford, Conn. Bids July 11. CD 5/29.

BUILDINGS—LB & CA

† **U. S. Eng.,** 150 Causeway St., Boston, Mass., rejected bids June 26, FAMILY HOUSING, Nahant, Wakefield, Wayland, Burlington. ENG-19-016-56-177, MASSACHUSETTS. LB **$899,000.** CD 7/2, under LB.

▲ **M. J. Walsh & Sons, Inc.,** 14 Shawmut Ave., Holyoke, Mass. CA **$1,624,734**. U-603 No. 1 Women's PHYSICAL EDUCATION BLDG., University of Mass., AMHERST, MASS. State, University of Mass., Kenneth Johnson, pres., c/o Div. Bldg. Constr., 38 Chauncy St., Boston, Mass. CD 6/19, under LB.

▲ **Granger Constr. Co., Inc.,** 306 Main St., Worcester, Mass. LB **$1,848,700**. Narragansett Regional JUNIOR-SENIOR HIGH SCHOOL, BALDWINVILLE, MASS. Towns of Templeton and Baldwinville, c/o Supt. Schools, Templeton, Mass. Bids July 5. CD 6/19.

Sewell Smith Constr. Co., Irving Square, Framingham, Mass. CA **$670,600,** est. $650,000. elementary SCHOOL Page Rd. and Old Billerica Rd., BEDFORD, MASS. Town, School Bldg. Comn., 39 Pine St., Bedford, Mass. CD 6/18, under LB.

Peabody Constr. Co., Inc., 27 Farragut Rd., South Boston, Mass. LB **$572,449**. Boston Trade HIGH SCHOOL addn. Sherwin District, Roxbury, BOSTON, MASS. City, Dpt. School Bldgs., 26 Norman St., Boston, Mass. Bids July 12. CD 6/21.

▲ **John Capobianco,** 101 Tremont St., Boston, Mass. LB **$1,939,000,** est. $1,900,000. JUNIOR-SENIOR REGIONAL SCHOOL, ORANGE-ERVING, MASS. Towns Orange and Erving, Regional Dist. School Comn., Orange, Mass. Bids July 12. CD 6/26.

▲ **Town,** Town Hall, Randolph, Mass., rejected bids June 4, ELEMENTARY SCHOOL, Liberty St., RANDOLPH, MASS. LB **$1,184,477**. CD 6/8, under LB.

▲ **George A. Fuller Co.,** 11 Beacon St., Boston, Mass. CA Est. **$1,000,000.** REVENUE ACCOUNTING BLDG., SALEM, MASS. New England Telephone & Telegraph Co., 185 Franklin St., Boston, Mass. CD 7/13.

Willard Center Realty Co., E. Harold Dick, atty., Hospital Trust Bldg., Providence, R. I., rejected bids Nov. 3, SHOPPING CENTER, PROVIDENCE, R. I. LB **$604,468**. Revised plans completed. CD 11/15, under LB.

Wadhams & May Co., 15 Lewis St., Hartford, Conn., LB **$567,131**. (4 bidders) 2 story HIGH SCHOOL addn., SUFFIELD, CONN. Town High School Bldg. Comn., Town Office Bldg., Suffield, Conn. Bids July 12. CD 6/28.

▲ **Feliz Buzzi & Son,** 612 S. Main St., Torrington, Conn., LB **$3,080,000,** est. $3,000,000. central OFFICE for State Hy. Dpt. and Hy. Dist. No. 1, WETHERSFIELD, CONN. State P. Wks. Dpt., 165 Capitol Ave., Hartford, Conn. Bids July 18. CD 7/5.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 3 Pennsylvania   August 7 New Jersey
STREETS AND ROADS
July 31 Maryland   August 2 New Jersey
August 3 Pennsylvania

▲ **N. J., Elizabeth**—BA 8/23—City, City Hall, storm sewer in northwest portion of city (1) Newark, Sherman and Jackson Aves. (2) Alina St., Cross Ave. and Lower Rd. $1,200,000. Alexander Potter Assocs., 30 Church St., New York, N. Y., engrs. CD 9/26.

BUILDINGS—BA

Del., Wyoming—SCHOOL—BA 8/1—Caesar Rodney Special School Dist., Wyoming, Caesar Rodney School addns., alterations, $800,000. Stanhope & Manning, 902 Orange St., Wilmington, archts. CD 12/9.

N. J., Bloomfield—SCHOOL—BA 8/21—Bd. Educ., Town of Bloomfield, second elementary school (Forest Glen), Fairview Dist. $700,000. Raymond B. Flatt, 36 Broad St., archt. CD 4/12.

BUILDINGS—SLC

▲ **Pa., Beaver Falls**—HOSPITAL—Providence Hospital, Beaver Falls, soon lets contract hospital addn., alterations, $1,000,000, Press C. Dowler, 803 Century Bldg., Pittsburgh, archt. CD 5/25.

▲ **Pa., Oakmont**—SCHOOL, etc.—St. Anthony's R. C. Congregation, Oakmont, soon lets contract 1 and 3 story, bsmnt., brick, block school, convent, $1,000,000. Casmir J. Pelligrini, 201 S. Craig St., Pittsburgh, archt. CD 1/18/55.

HEAVY CONSTRUCTION—LB & CA

▲ **Rao Electrical Equipment Co., Inc., Arc Electrical Constr. Co., Inc.,** and **Tully & DiNapoli, Inc.,** 314 E. 39 St., New York 16, N. Y. LB **$2,448,706**. furnishing, installing 69 kv underground transmission system between 75 Street sub-station and 59 Street substation, Contr. P-181, Manhattan Boro, NEW YORK, N. Y. New York City Transit Auth., 370 Jay St., Brooklyn 1, N. Y. Bids June 29. CD 6/15.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,

Pa.—**Putnam & Greene, Inc.,** Box 2012, Sta. A, Fort Wayne, Ind. LB **$561,491** (7 bidders) constr. 24,264 ft. crushed aggregate base with bit. surf. 22 ft. wide, Morris and Cooper Twps., T.R. 53, Clearfield Co.;

Pa.—**Wilson-Benner, Inc.,** 150 Dunlop St., Bellefonte, Pa. LB **$481,864** (5 bidders) wid'n. 31,619 ft. existing road with crushed aggregate base and bit. surf. variable with Colebrook, Bald Eagle and Allison Twps., Lock Haven City, T.R. 120, Clinton Co.;

Pa.—**J. H. Beers,** R.D. 2, Bangor, Pa. LB **$412,241** (5 bidders) wid'n. existing road with crushed aggregate base surf., new and existing base with bit. surf. 22 ft. wide, 1 bridge, Delaware, Dingman and Milford Twps., Milford Boro, Pike Co.;

Pa.—**Paoli Constr. Co.,** 171 W. Lincoln Hy., Paoli, Pa. LB **$199,680** (9 bidders) constr. 4,873 ft. crushed aggregate base with bit. surf. W. Goshen and E. Branford Twps., L.R. 775 (2), Chester Co.;

Pa.—**Marsolino Constr. Co.,** 309 Fayette National Bank Bldg., Uniontown, Pa. LB **$175,040** (3 bidders) constr. 3,389 ft. rein.-con. 36 ft. wide, Uniontown, T.R. 119, Fayette Co.;

Pa.—**J. A. & W. A. Hess, Inc.,** 309 National Bank Bldg., Hazleton, Pa. LB **$81,628** (3 bidders) 2,150 ft. crushed aggregate base with bit. surf. Nescopeck and Sugar Loaf Twps., T.R. 29, Luzerne Co. Bids July 13. CD 6/20.

BUILDINGS—LB & CA

▲ **Central School Dist. No. 1,** Massena, N. Y. rejected bids July 5, 4 ELEMENTARY SCHOOLS for towns of Alcoa, Haverstock, Nightingale and Louisville, MASSENA, N. Y. CD 7/13, under CA.

Leon D. DeMatteis Constr. Corp., 827 Elmont Rd., Elmont, L. I., N. Y. LB **$655,827**. general contract addn. to Herrick School to convert to JUNIOR HIGH SCHOOL, NEW HYDE PARK, N. Y. Bd. Educ., Union Free School Dist. No. 9, town, North Hempstead, New Hyde Park, N. Y. Bids July 10. CD 6/25, under N. Y., Herricks.

▲ **Fatzler Constr. Co.,** 653 S. 15 St., Newark, N. J., Owner Builds. **$1,000,000.** 42-unit garden APARTMENT, S. Harrison St. at Elliot Pl., EAST ORANGE, N. J. Emil Schmidlin, 586 Central Ave., East Orange, N. J., archt.

Harold Kramer & Al Carletta, 100 Ridge Rd. Ave., Passaic, N. J. Owner Builds. **$900,000.** 40 HOUSES at Emerson Park, Parker Dr. off Linden Ave., EMERSON, N. J. Rudolph L. Novak, 89 Central Ave., Clifton, N. J., archt.

† **Dean Constr. Co., Inc.,** 29-28 41 Ave., Long Island City, N. Y., CA, **$543,569** POST EXCHANGE and site imprvs., ENG-36-109-56-76, FORT DIX, N. J. U. S. Eng., 2653 Abbottsford Rd., Phila., Pa. Bids June 21. CD 7/3, under LB.

▲ **Delco Builders Co., Inc.,** Route 46, Ledgewood, N. J. Owner Builds. **$4,000,000.** 158 HOMES at Lake Hopatcong, west shore of lake near River Styx, Elba Point Estates, LAKE HOPATCONG, N. J. Samuel Paul, 89-51 164 St., Jamaica, N. Y., archt.

Isaac Putterman, Carmel, N. Y. Owner Builds. **$700,000**. SHOPPING CENTER on site of old Memorial Hospital and parking area, MORRISTOWN, N. J. Schulman & Soloway, 100-15 Queens Blvd., Forest Hills, N. Y., archts.

▲ **Clover Estates,** Marvin Broder, pres., Box 646, Spotswood, N. J. Owner Builds. **$4,000,000.** second portion 265 HOMES, Summerhill Rd., to be known as Clover Estates, SPOTSWOOD, N. J. Lester Cohen, 234 Clinton Pl., Hackensack, archt.

▲ **Barba Co.,** 1 Canoe Brook Parkway, Summit, N. J. Owner Builds. **$3,000,000.** 187 HOMES Morris Turnpike, to be known as Forrest Park, SUMMIT, N. J. David Ludlow, 332 Springfield Ave., Summit, N. J., archt.

Gorovoy Inc., Jackson Valley Rd., Washington, N. J., Owner Builds, **$800,000.** HOUSING DEVELOPMENT, Pleasant Valley Way, WASHINGTON TWP., N. J. Elliott Coe, 41 Clinton Ave., Ridgewood, N. J., archt.

▲ **Montgomery Constr. Co.,** Grove City, Pa. CA Est. Over **$1,000,000.** Galbreath HALL to house students, NEW WILMINGTON, PA. Westminster College, New Wilmington, Pa. Bids June 4, awarded July 12. CD 6/22.

Jackson Builders, 3513 West Chester Pike, Newtown Square, Pa. Separate Contracts. **$585,000.** RESIDENTIAL DEVELOPMENT, Township Line, PLYMOUTH MEETING, PA.

† **B. J. Lucarelli Co., Inc.,** 22 Orchard St., Jersey City, N. J. CA **$749,761**. two BARRACKS with MESS and site imprvs., utilities, ENG-36-109-56-64, TOBYHANNA, PA. U. S. Eng., 2635 Abbottsford Rd., Phila., Pa. CD 6/25, under LB.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 3 Alabama
STREETS AND ROADS
August 3 Alabama

† **Ga., Dawsonville** — RUNWAY REHABILITATION — BA 8/13—Lockheed Aircraft Corp., Georgia Div., Marietta, Ga., Air Force Plant No. 6, constr. runway rehabilitation, Dobbins Air Force Base, Marietta, for Lockheed Aircraft Corp., Ga. Division for Dpt. Air Force. Plans deposit $25. Wilson & Co., 705 E. Crawford St., Salina, Kan., archts. CD 4/12, under Public Buildings.

BUILDINGS—BA

▲ **Ala., Huntsville**—HOUSING—BA On Or About 8/14—U. S. Eng., 2301 Grand St., Mobile, Zone 7, Phase II, 400-unit Capehart Family Housing, Redstone Arsenal, ENG-01-076-57-7.

(Continued on page 92)

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GULF

(Continued from page 90)

HEAVY CONSTRUCTION—LB & CA

▲† **Irons & Reynolds, Inc.,** 1724 "H" St. N. W., Wash., D. C., CA **$1,723,333.** aircraft maintenance hangar, Naval Air Station, NOy 91353, Spec. 48282, CHINCOTEAGUE, VA. Dist. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, Va. Bids June 26. CD 6/29, under LB.

▲† **Virginia Engineering Co., Inc.,** 80 Twenty-Ninth St. Newport News, Va., CA, **$1,322,500.** 150-man bachelor Officers' quarters, mess facilities, Naval Air Station, NOy 91375, Spec. 48295, OCEANA, VA. P. Wks. Office, Fifth Naval Dist. U. S. Naval Base, Norfolk, 11, Va. Bids May 22, awarded July 11. CD 5/28, under LB.

† **Virginia Engineering Co., Inc.,** 80 29 St., Newport News, Va., CA, **$922,000** Item No. 1, 3 story, concrete steel 668-man barracks bldg., Naval Air Station, NOy 91325, Spec. 48263, OCEANA, VA. P. Wks. Office, Fifth Naval Dist. U. S. Naval Base, Norfolk 1, Va. Bids May 29, awarded July 11. CD 6/5, under LB.

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh,

Crowder Constr. Co., Inc., 1123 E. 10 St., Charlotte, N. C. CA **$509,580,** est. $400,000-$500,000, structures 4.21 mi. U. S. 15 and 501 west side By-Pass of Durham, Proj. 4140, SF 716 (1), Durham Co. Bids June 26, awarded July 12. CD 7/2, under LB.

NORTH CAROLINA—State Hy. & P. Wks. Comn., Raleigh,

Nello L. Teer Co., Durham, N. C. CA **$570,597.** est. $300,000-$400,000. grading 4.21 mi. U. S. 15 and 501 west side By-Pass of Durham, Proj. 4140, SF 716 (1) Durham Co. Bids June 26, awarded July 12. CD 7/2, under LB.

▲ **FLORIDA**—State Road Dpt., Tallahassee,

Fla.—**Diamond Constr. Co.,** Box 647, Savannah, Ga., LB **$995,382** (8 bidders) bridge over Loxahatchee River near Jupiter, F-003-3 (24), Job 9304-204, SR5, Palm Beach Co;

Fla.—**Hardaway Constr. Co.,** Box 1360, Columbus, Ga., LB **$1,037,338** (4 bidders) structures across Big Sarasota Pass, SR 789, State Proj. Job 1715-175, Sarasota Co. Bids July 12. CD 6/12.

▲ **Bd. Comrs. Dade Co.,** Court House, Miami, Fla., rejected bids June 12, Part 2, National Airlines Nose Hangar, Miami International Airport, MIAMI, FLA. Will re-advertise. CD 6/19, under LB.

▲† **A. B. Newton & Co.,** Vidalia, Ga., CA, **$1,471,000.** Class C maintenance hangar, Naval Air Station, NBy-5653, BRUNSWICK, GA. P. Wks. Officer, Dpt. Navy, Naval Base, S. C. Bids June 26. CD 7/5, under LB.

▲ **Bush Building Co.,** 805 Eighth Ave. N., Nashville, Tenn. LB **$579,850.** Contr. 1, sewage disposal plant, Contr. 2, trunk sewers, Contr. 3, lift stations, MADISONVILLE, KY. City, City Hall, Madisonville, Ky. Bids July 12. CD 6/20;

Sterett Constr. Co., Cannelton, Ind. LB **$312,389.** Contr. 2, trunk sewers. (Madisonville, Ky.);

C. F. W. Constr. Co., Fayetteville, Tenn. LB **$345,810.** Contr. 3, lift stations, (Madisonville, Ky.)

Watkins Constr. Co., Gadsden, Ala., LB **$599,131** natural gas sys. FRANKLIN, TENN. City, City Hall, Franklin, Tenn. CD 5/1.

BUILDINGS—LB & CA

▲ **Alcon Development Corp.,** Hotel Commodore, Maury, Granby and Freemason Sts., Norfolk, Va., CA **$6,974,162.** 525-unit Capehart HOUSING, ENG-44-110-56-28, Fort Lee-Richmond Quartermaster Depot, FORT LEE, VA. U. S. Eng., foot of Front St., Norfolk 1, Va. Bids June 13, awarded July 9. CD 6/15, under LB.

▲ **Tower Constr. Co.,** 1726 L St. N. W., Wash., D. C., Owner Builds. **$3,000,000.** SHOPPING CENTER, Southside Plaza, McGuire Circle, RICHMOND, VA. Jos. Saunders & Assocs., 121 S. Columbus St., Alexandria, Va., archt.

▲ **Raymond L. Tassinari,** 1424 N. W. 14 Ave., Gainesville, Fla., LB **$1,284,840.** LABORATORY SCHOOL, University of Florida, GAINESVILLE, FLA. Florida State Bd. Control, Admin. Bldg., University of Florida, Gainesville, Fla. Bids July 10. CD 6/20.

Suburban Greens, Inc., 1693 N. E. 123 St., Miami, Fla., Owner Builds. **$526,450.** 77 RESIDENCES, N. E. 205 Terrace and 13 Ave., MIAMI, FLA.

Sullivan, Long & Hagerty, 2028 2 Ave. N., Bessemer, Ala., CA **$500,000.** SILO, GRAIN ELEVATOR and other STORAGE FACILITIES, BIRMINGHAM, ALA. Western Grain Co., 1003 N. 17 St., Birmingham, Ala. CD 4/2.

W. K. Upchurch Constr. Co., Old South Life Bldg., Montgomery, Ala., CA **$508,591.** 2 story, 50-bed wing of St. Jude's HOSPITAL, to be called Father Harold Purcell Memorial Wing for crippled and spastic children, on Fairview Ave., MONTGOMERY, ALA. Mobile-Birmingham Catholic Diocese, 400 Government St., Mobile, Ala. Sherlock, Smith & Adams, 303 Washington St., Montgomery, Ala., archts. Awarded July 5.

Barksdale & LeBlanc, 6425 Greenwell Springs Rd., Baton Rouge, La. CA **$938,367.** HIGH SCHOOL at Napoleonville No. 5604; W. H. Reed HIGH SCHOOL at Napoleonville, No. 5605-W, NAPOLEONVILLE, LA. Assumption Parish School Bd., N. E. Carmouche, Platenville, La. Bids June 20. CD 11/20/51.

W. A. McMichael Constr. Co., Box 508, Shreveport, La. LB **$973,944.** (6 bidders) Proj. 25, GRADE SCHOOL, Ellerbe Rd., SHREVEPORT, LA. Caddo Parish School Bd., Shreveport, La. S. G. Wiener & Assn., Commercial Bank Bldg., Shreveport, La., archts. CD 9/14/51.

T. U. Parks Co., 711 E. Main St., Chattanooga, Tenn., LB **$775,376,** RESIDENT DORMITORY on campus, CHATTANOOGA, TENN. University of Chattanooga, McCallie Ave., Chattanooga, Tenn. CD 3/30.

J. D. Owen Constr. Co., 307 Arlington Ave., Nashville, Tenn. LB **$581,644,** Glencliff JUNIOR HIGH SCHOOL, NASHVILLE, TENN. Davidson Co. Bd. Educ., Nashville, Tenn. CD 10/28.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

▲† **O., Dayton**—NUCLEAR ENGINEERING TEST FACILITY—BA 9/25—U. S. Eng., 830 W. Broadway, Louisville, Ky., nuclear engineering test facility, incl. engineering test reactor bldg., light water moderate reactor capable of operation up to and incl. 10 thermal megwatts, guard house, water softening plant, site preparation, utilities. $6,000,000. Ralph M. Parsons Co., 617 S. Olive St., Los Angeles, Calif., consult engr. CD 7/6, under LB.

BUILDINGS—BA

O., Toledo—HOSPITAL—BA 9/1—Bd. Directors Flower Hospital, Cherry St., hospital addns., 4 story, bsmnt. wing to contain X-ray and physiotherapy depts., upper 3 stories for patients, 1 story, bsmnt., emergency dept., morgue and admin. offices. $700,000. Bellman, Gillett & Richards, 1600 Madison St., archts. CD 2/28.

▲ **Ill., Danville**—FACTORY, etc.—BA 8/3—Tee-Pak, Inc., 3520 S. Morgan St., Chicago, 150,000 sq. ft. factory and office, $1,200,000. A. Epstein & Sons Co., 2011 Pershing Rd., Chicago, Zone 9, archts.

BUILDINGS—SLC

Ill., Cicero—PLANT—Sommer & Maca Glass Machinery Co., 3600 S. Oakley Ave., Chicago, soon lets contract 66,000 sq. ft. plant, 5500 W. Ogden St. $650,000. Ambrose N. Richardson, c/o University of Illinois, Champaign, archt.

HEAVY CONSTRUCTION—LB & CA

▲ **Dravo Corp.,** Neville Island, Pittsburgh, Pa. CA **$1,324,750.** intake tower and pumping station at Berlin Reservoir, YOUNGSTOWN, O. Mahoning Valley Sanitary Dist., P. O. Box 298, Youngstown 1, O. Bids July 10, awarded July 13. CD 7/16, under LB.

Great Lakes Dredge & Dock Co., 740 N. Plankington Ave., Milwaukee 3, Wis., CA, **$838,440.** auto and passenger pier, MILWAUKEE, WIS. Bd. Harbor Comn., City Hall, Milwaukee, Wis. Bids June 4. CD 6/11, under LB.

Rocco Ferrera & Co., P.O. Box 4826, Redford Station, Detroit 19, Mich. CA **$658,400.** Contr. WS-75B, Diversey-Paney water main, 6,925 ft. 72 in. pipe in Diversey and Payne Aves. between Calhoun and Tireman Aves., DETROIT, MICH. City, Glen C. Richards, comr., City-County Bldg., Detroit, Mich. Bids June 20. CD 6/5.

George A. Odien, 1935 McGraw St., Detroit 8, Mich. CA **$527,768.** Contr. 1, 19,110 ft. 10- to 30-in. sanitary sewers, force main, also wet well and pumping station; Contr. 2, 28,600 ft. 8- to 24-in. sanitary sewers, PLYMOUTH, MICH. City, Kenneth E. Way, city clk., 175 S. Main St., Plymouth, Mich. Bids June 28. CD 6/22.

BUILDINGS—LB & CA

▲ **Model City Development Co.,** 924 N. Bend Rd., Cincinnati, O. Own Forces **$2,250,000.** 110 1 floor, split level bsmnt., bsmntless, brick HOMES near Greenhills area, CINCINNATI, O. Vogt, Ivers & Seaman, 34 W. Sixth St., Cincinnati, O., engrs. CD 5/15.

▲ **Leo W. Schmidt Co.,** 9920 Granger Rd., Cleveland 25, O. CA Est. **$1,000,000.** (7 bidders) HIGH SCHOOL for Sisters of St. Joseph, PARMA HEIGHTS, O. Catholic Diocese of Cleveland, 1027 Superior Ave., Cleveland 14, O. Bids July 2, awarded July 5. CD 12/27.

▲ **Harry H. Verkler,** 645 Wilber St., South Bend, Ind., CA, **$3,448,350.** HOSPITAL addn., 604 N. Main St., SOUTH BEND, IND. Memorial Hospital of South Bend, 604 N. Main St., South Bend, Ind. Awarded July 9. CD 7/2, under LB.

▲ **Sumner Sollitt Co.,** 307 N. Michigan St., Chicago 1, Ill., CA, **$5,000,000.** HEADQUARTERS BLDG., CHICAGO, ILL. American Hospital Assoc., Lake Shore and Pearson Sts., Chicago, Ill. Awarded July 10. CD 9/22/54.

▲ **Alexander & Kingbay,** 461 Hiawatha Ave., Minneapolis, Minn., CA **$2,250,000.** 1 story, part bsmnt., 218,000 sq. ft. Fairview Plaza SHOPPING CENTER, 1411 West King St., DECATUR, ILL. American Shopping Center, Inc., 1801 Nicollet Ave., Minneapolis 3, Minn. S. H. Morris & Assocs., 134 N. La Salle St., Chicago, Ill., engrs.

▲ **Tunnicliff-MacDonald,** 3429 Miller St., Davenport, Iowa, CA **$2,244,500,** general contract, SENIOR HIGH SCHOOL, MOLINE, ILL. Bd. Educ., 1619 11 Ave., Moline, Ill. Bids June 26;

Moline Heating & Constr. Co., 320 16 St., Moline, Ill., CA **$543,179,** plumbing, heating and ventilating work (Moline, Ill.)

Oliver Constr. Co., R3 Oconomowoc, Wis., LB **$671,874** general contract HIGH SCHOOL, MUSKEGO, WIS. Union High School Dist. No. 2, Muskego, Wis. Bids July 3. CD 6/22.

▲ **Biltmore Constr. Co.,** 17615 James Couzens Hy., Detroit, Mich. Owner Builds. **$5,200,000.** 400 brick HOMES, Arcola Rd. in Cherry Hill Sect., GARDEN CITY, MICH.

▲ **Miller-Davis Co.,** 1029 Portage St., Kalamazoo, Mich. CA **$1,678,300.** WAREHOUSE, OFFICE and GARAGE, GRAND RAPIDS, MICH. Kroger Co., 1240 State St., Cincinnati, O. CD 7/13, under LB.

▲ **Holtzman & Silverman,** 2120 National Bank Bldg., Detroit 26, Mich. CA Est. **$1,500,000.** 90 brick ranch HOMES, Peerless and Hunt Club Dr., HARPER WOODS, MICH. Arthur J. Scully (agt.), 20169 Mack St., Grosse Pointe, Mich.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 2 Missouri
STREETS AND ROADS
August 2 Missouri   August 17 Minnesota

▲ **Minn., Bloomington (P. O. Minneapolis)**—BA 8/3—Village, H. E. Kossow, clk., 10200 Penn Ave. S., Storm Sewer Proj. No. 3, 3,000 lin. ft. storm sewers, $183,000; Storm Sewer Proj. 4, 31,500 lin. ft. storm sewers, $1,350,000. Plans deposit $100. G. M. Orr Eng. Co., 1004 Marquette Ave., Minneapolis, engr. CD 4/17.

▲† **Okla., Altus**—PARKING APRON—BA 8/15—U. S. Eng., Box 61, Tulsa, Zone 2, operational parking apron and hydrant fueling sys., Altus Air Force Base, ENG-34-066-57-2, $1,000,000.

BUILDINGS—BA

▲ **Kan., Hays**—HOSPITAL—BA 8/1—Hadley Memorial Hospital, Seventh and Oak Sts., hospital addn. $1,000,000. Woods & Starr, Hays, archts. CD 10/6/53.

Minn., Ely—HOSPITAL—BA 8/2—Ely-Bloomenson Community Hospital, city of Ely. A. O. Knutson, clk., Ely, hospital, $550,000. Plans deposit $25, Magney, Tusler & Setter, 303 Roanoke Bldg., Minneapolis archts. CD 10/20.

▲ **Tex., Houston**—SCIENCE—BA 8/7—**Texas** Southern University, 3201 Wheeler St., science bldg. $1,410,000. Wyatt C. Hedrick, 5201 Fannin St., Houston, archt. CD 7/16.

Okla., Ada—INDUSTRIAL ARTS—BA 9/12—Bd. Regents, Capitol, Oklahoma City, Zone 5, industrial arts bldg. at East Central College, $500,000. Albert S. Ross, Ada, archt. CD 10/13.

▲ **Tex., Sweetwater**—MILL, etc.—Bids Asked—Flintkote Co., 30 Rockefeller Plaza, New York, N. Y. gypsum mill, $8,000,000; storage or warehousing unit, $500,000. CD 6/12.

HEAVY CONSTRUCTION—LB & CA

C. Rallo Contg. Co., 5000 Kemper Ave., St. Louis 9, Mo. LB **$581,000,** est. $350,000 natatorium to contain large swimming pool, permanent bleachers, locker rooms, UNIVERSITY CITY (ST. LOUIS 5 P.O.), MO. School Dist. of University City, Bd. Educ., E. E. Watson, asst. supt., 6701 Delmar Blvd., University City 5, Mo. Bids July 10. CD 6/20, under Public Bldgs.

TEXAS—State Hy. Comn., Austin,

Tex.—**Ottinger Constr. Co.,** P.O. Box 12035, Fort Worth, Tex.; LB **$485,620.** St. L.S.W. Underpass and approaches 1.248 mi. on Hy. U.S. 175 and State 31, Proj. UF 575 (9), UG 575 (10) and UF 576 (4), Henderson Co.;

Tex.—**Kidwell & Rogers Constr. Co.,** 4515 Prentice St., Dallas, Tex., LB **$206,116,** Sandy Creek Bridge and approaches 0.617 mi. Proj. C-134-7-17, Wise Co. Bids July 17. CD 6/28.

▲ **TEXAS**—State Hy. Comn., Austin,

Tex.—**Collins Constr. Co. of Texas,** P.O. Box 1192, Austin, Tex., LB **$309,339.** flex. base, one crs. surf. tr. 9.453 mi. Hy. SH 144, Proj. S-435 (2), Bosque Co.;

Tex.—**J. O. Boswell,** 311 Paris Ave., Lubbock, Tex., LB **$402,408,** flex. base, two crs. surf. tr. 15.734 mi. Hy. US 87, F-613 (13), Dawson Co.;

Tex.—**T. E. Sanderford,** P.O. Box 58, Belton, Tex., LB **$129,142** grading, structures base, surf. 9.117 mi. on Hy. FM 2268, Proj. R 2136-1-1, Bell Co.;

Tex.—**Ballenger Constr. Co.,** P.O. Box 943, San Benito, Tex., LB **$118,663,** grading, structures, base, surf. 10.048 mi. Hy. FM 2358, Proj. R 1801-2-1 and R-2243-1-3, Cameron Co.;

Tex.—**H. B. Zachry Co.,** P.O. Box 10188, San Antonio, Tex., LB **$424,594,** flex. base, two crs. surf. tr. 9.572 mi. Hy. US 277, Proj. S 213 (3), Coke and Runnels Counties; LB **$516,926,** flex. base, two crs. surf. tr. 6.991 mi. Hy. US 281, Proj. F-437 (7), Jack Co.;

Tex.—**Johnson T. Leslie,** Bailey, Tex., LB **$78,862,** grading, structures, base, surf. 1.986 mi. Hy. FM 904, Proj. R 1203-3-1, Delta Co.;

Tex.—**Austin Bridge Co. & Austin Contg. Co.,** P.O. Box 1590, Dallas, Tex., LB **$402,000.** grading, structures, base, surf. 12.739 mi. Hy. FM 157 and 875, Proj. S-450 (2), Ellis Co.;

Tex.—**Austin Road Co.,** P.O. Box 1590, Dallas, Tex. LB **$194,359,** c. conc. 0.64 mi. and T. & P. R.R. Overpass on Hy. US 69, Proj. F 707 (1) F.G. 707 (2), Grayson Co.;

Tex.—**The Jarbet Co.,** P.O. Box 5008, San Antonio, Tex., LB **$308,232,** flex. base, b. conc. 7.724 mi. Hy. SH 90, Proj. S-1584 (1), Grimes Co.;

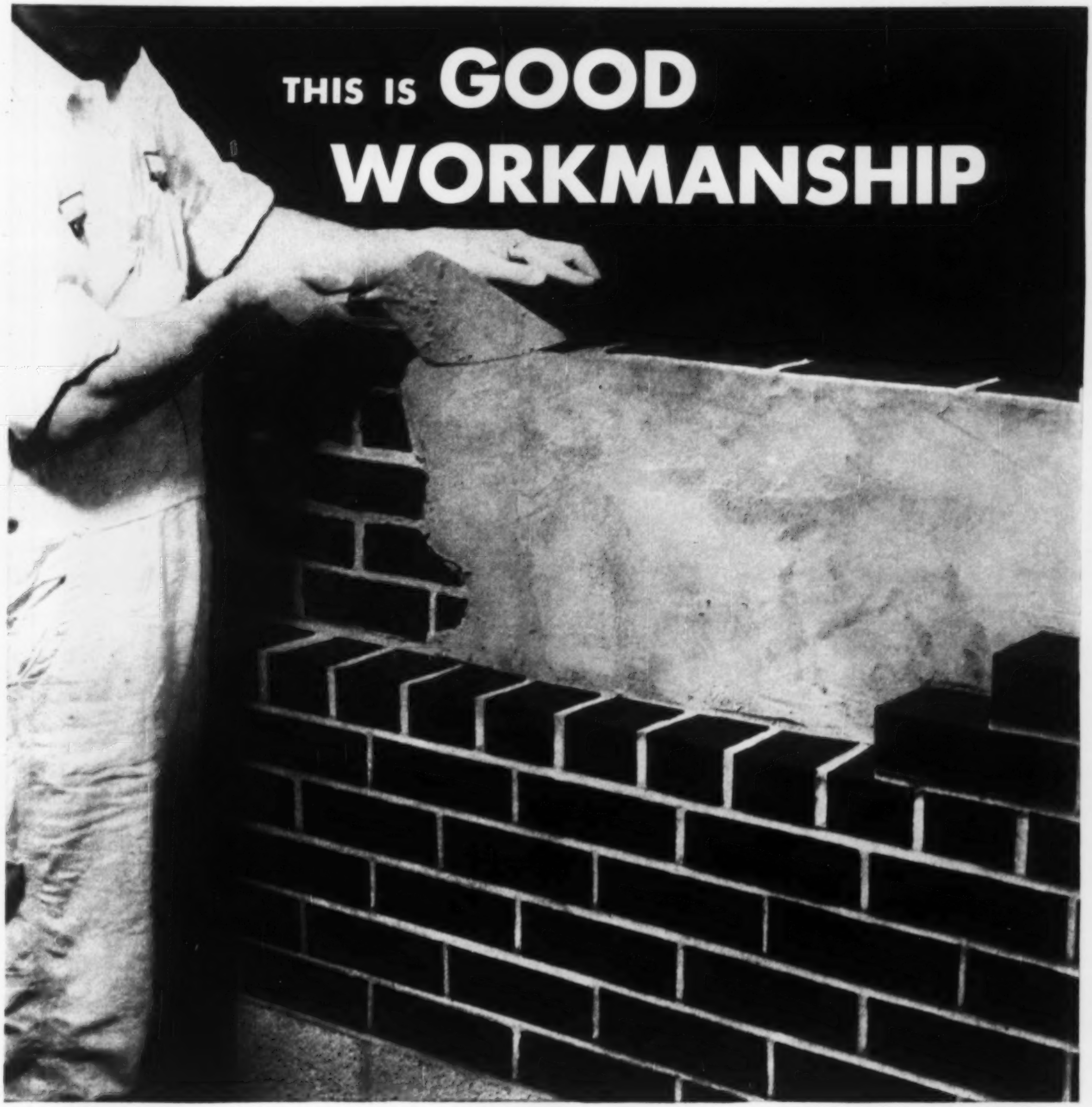
Tex.—**E. & M. Bohuskey Constr. Co.,** P.O. Box 1226, Harlingen, Tex., LB **$115,381.** grading, structures, base, surf. 7.586 mi. Hy. FM 907, Proj. R 1586-1-2, Hidalgo Co.;

Tex.—**Reynolds & Huff,** P.O. Box 88, Tyler, Tex., LB **$201,066,** grading, addn. base and surf. 11.827 mi. Hy. FM 71, Proj. C 546-6-5, Hopkins Co.;

Tex.—**R. W. McKinney,** P.O. Box 190, Nacogdoches, Tex. LB **$227,117,** grading, structure, base, surf. 6.433 mi. Hy. FM 1280, Houston Co.;

(Continued on page 95)

THIS IS GOOD WORKMANSHIP



GOOD workmanship is one of the most important factors in preventing leaky brick walls.

Good workmanship includes wetting the brick—completely filling the head and bed joints—and back-plastering the face brick before the back-up units are laid.

Expect trouble when the face brick are not parged. Even if the space between the face brick and the back-up units is slushed, it cannot be completely filled with mortar. Voids are left between the mortar and the brick, through which water may enter, trickle down and leak to the inside of the wall.

Brixment mortar enables the bricklayer to back-plaster quickly and easily. Brixment mortar has great plasticity, high water-retaining capacity and bonding quality, great resistance to freezing and thawing, and freedom from efflorescence. Because of this *combination* of advantages, Brixment is the leading masonry cement on the market.

BRIXMENT

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KENTUCKY

Lake View Sand and Gravel Company
Fond du Lac, Wisconsin

READY MIXED CONCRETE

Trucks Run 100,000 Miles Before Overhaul with Cities Service C-300 Motor Oil!

CHART SHOWS LAKE VIEW'S 13-YEAR SAFETY RECORD

"Cities Service helped keep machinery in safest operating condition," says Manager Eugene Clement.

	SAFETY			
Year	Construction 1st Place	Group Awards 2nd Place	Building Supply 1st Place	Group Awards 2nd Place
1943			X	
1944	X		X	
1945	X		X	
1946	X		X	
1947	X			
1948		X		X
1949	X			X
1950	X		X	
1951				X
1952			X	
1953				X
1954				X
1955		X	X	

NOTE: Lake View also received a "No Accident Award" for years, 1945, '47.

Lake View Sand and Gravel also chalks up phenomenal 13-year safety record.

At Lake View Sand and Gravel Company, dump trucks run almost as much while standing as while moving.

"So you can see," says Manager Eugene Clement, "that the 100,000 mile overhaul period we're getting with Cities Service C-300 Motor Oil is really something!

"It's actually twice our former mileage with another brand of motor oil! And it certainly hasn't affected our safety record. For 13 years we've won Wisconsin safety awards—and we couldn't possibly have done it without top-notch maintenance and top-notch lubricants.

"Trojan H-2 Multi-Purpose Grease is an example of good, simplified lubrication. We use it for wheel bearings, water pumps and general chassis lubrication and find it not only offers greater water resistance, but also pumps easier in low temperatures. It's advantages like this that make me mighty glad I switched to Cities Service."

This is another report of a firm's outstanding results with Cities Service products. Find out what these products can do for you. Talk with your Cities Service representative or write: Cities Service Oil Co., Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

(Continued from page 92)

Tex.—**Border Constr. Co.**, P.O. Box 188, Zapata, Tex., LB **$85,591**, grading, structures, base, surf. 10.491 mi. Hy. FM 1908, Proj. S-2128 (1), Kinneh Co.;

Tex.—**Allen Keller Co.**, P.O. Box 393, Fredericksburg, Tex. LB **$161,632**. grading, structures, base, surf. 10.474 mi. Hy. RM 962, Proj. R 2204-1&2-1&1, Llano and Blanco Counties;

Tex.—**McKown Bros., Inc.**, P.O. Box 785, Austin, Tex., LB **$127,479**, grading, structures, base, surf. 8.542 mi. Hy. EM 2322, Proj. R 2210-1-1, Travis Co.;

Tex.—**Ernest Loyd**, P.O. Box 1120, Fort Worth, Tex., LB **$113,730**. grading, structures, base, surf. 6.623 mi. Hy. FM 2193, Proj. R 1405-4-2 and R-2238-1-1, Washington Co. Bids July 17. CD 6/28.

Floyd Haake, Box 4035, Coronado Station, Santa Fe, N. M. LB **$579,620**. Schedule A, county-city airport, SANTA FE, N. M. City and Santa Fe Co., Santa Fe, N. M. Bids June 27. CD 1/23;

Reynolds Electric Co., 475 Wyoming Blvd. S.E., Albuquerque, N. M. LB **$98,063**. Schedule C, electric work on city-county airport (Santa Fe, N. M.).

BUILDINGS—LB & CA

Carl Brown, Cook, Minn. LB **$636,000**. general constr. 1 story SCHOOL, Cook, DULUTH, MINN. Bd. Educ., St. Louis Co., W. W. Salmi, supt. Schools, Court House, Duluth, Minn. Bids July 11. CD 7/5.

▲ **John B. Gutmann Constr. Co.**, 1301 S. Vandeventer Ave., St. Louis 10, Mo. CA Est. **$1,500,000**. 3 story brick, concrete HEADQUARTERS OFFICE 2 acre tract at Hampton and Roberts Ave., ST. LOUIS, MO. Carpenters Dist. Council of St. Louis, Ewin C. Meinert, secy.-treas., 3606 Couzens Ave., St. Louis 13, Mo. Study, Farrar & Majers, Arcade Bldg., 812 Olive St., St. Louis 1, Mo., archts.

Bd. **Regents**, Capitol, Oklahoma City 5, Okla. rejected bids July 11, PHYSICAL EDUCATIONAL BLDG at Southwestern State Teachers College, WEATHERFORD, OKLA. LB **$650,010**. CD 6/20.

▲ **J. J. Holmes, Contractor**, 816 E. 31 St., Austin, Tex., CA, **$1,750,000**. SHOPPING CENTER, Eldorado Hills area off Buffalo Gap Rd., ABILENE, TEX. J. J. Holmes, 816 E. 31 St., Austin, Tex. CD 6/5.

▲ **John J. Stokes Constr. Co.**, 1104 T & P Pass Bldg., Fort Worth, Tex., CA, **$1,995,000**. CONVENTION CENTER and MUNICIPAL AUDITORIUM, AUSTIN, TEX. City, City Hall, Austin, Tex. Bids June 5. CD 6/8, under LB.

▲ **Bigler & Bigler Contractors**, Box 3173, Corpus Christi, Tex., LB **$1,027,732**, Phase 2 superstructure for Parkdale Plaza SHOPPING CENTER, CORPUS CHRISTI, TEX. Parkdale Plaza Co., 916 Med. Prof. Bldg., Corpus Christi, Tex. Bids July 12. CD 6/29.

FAR WEST

BUILDINGS—BA

▲ **Calif., Camp Irwin**—HOUSING—BA 8/10—U. S. Eng., 751 S. Figueroa St., Los Angeles, construct and finance Capehart family housing, Armored Combat Training Center, ENG-04-353-57-1. $4,500,000.

BUILDINGS—SLC

▲ **Calif., Palmdale**—PLANT—General Dynamics Corp., Convair Div., 3156 Pacific Hy., San Diego, soon lets contract permanent production flight facility, Air Force Plant No. 42, Contract No. 6. $3,240,000. Plans deposit $50. Moffatt & Nichols, Inc., 122 W. 5 St., Long Beach, engr.

HEAVY CONSTRUCTION—LB & CA

IDAHO—State Hy. Dpt., Boise,

Duffy Reed Constr. Co., Twin Falls, Idaho, CA **$627,306**, roadway, drainage structures 4.45 mi. and bit. tr. 5.202 mi. U.S. 95, Nez Perce Co. Bids July 3, awarded July 10. CD 6/20.

IDAHO—State Hy. Dpt., Boise,

rejected bids June 29, reconstr., roadway, bit. surf. 13.541 mi. State Hy. 25, maint. stockpiles, Jerome Co., LB **$691,395**. CD 7/2, under LB.

UTAH—State Road Comn., State Capitol, Salt Lake City,

Utah—**Germer, Abbott & Waldron**, Trementon, Utah, LB **$329,395**, road mix bit. surf. 25.597 mi. State Rd. 47, Proj. S0402-(1), San Juan Co.;

Utah—**Gibbons & Reed**, Box 2429, Salt Lake City, Utah, LB **$378,909**, b. conc. surf. 2,015 mi., 1 concrete bridge on State St., Salt Lake Co.;

Utah—**L. B. Sorenson Constr.**, 1330 W. 4200 South, Murray, Utah, LB **$89,953**, road mix bit. surf. 3.478 mi. State Rd. 180, Proj. S 0107 (1), Tooele Co. Bids July 10.

▲ **Duncan Constr. Co. & U. S. Pipeline Co.**, Moses Lake, Wash., CA **$1,195,033**, est. $1,750,000. natural gas distr. sys., MOSES LAKE, WASH. City, City Hall, Moses Lake, Wash. Bids June 19. CD 6/25, under LB.

† **OREGON**—Bureau P. Rds., Dpt. Commerce, Morgan Bldg., Portland,

P. W. Hamer & Assoc., Glide, Ore. CA **$737,755**. (10 bidders) grade 12.8 mi. of forest development road, Baker Co. Bids July 10. CD 6/26.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,

Calif.—**Fredericksen & Kasler**, 212 13 St., Sacramento, Calif., LB **$836,656** (3 bidders) grading, surf. 2.8 mi. U.S. 99, 2 bridges and 1 pumping plant, Tulare Co.;

Calif.—**Valley Paving & Constr. Co., Inc.**, P. O. Box 6, Pismo Beach, Calif., LB **$111,675** (3 bidders) surf. 29.1 mi. hys. at various locations, San Luis Obispo and Santa Barbara Counties;

Calif.—**Lee J. Immel**, 13555 San Pablo Ave., San Pablo, Calif., LB **$134,610** (5 bidders) wid'n., surf. 1.5 mi. Rte. 75, Contra Costa Co. Bids July 11. CD 6/18.

▲ **East Bay Municipal Utility Dist.**, 512 16 St., Oakland, Calif., rejected bids pumping plant in Pleasant Hills Area, Walnut Creek, OAKLAND, CALIF. LB **$1,144,043**. Will re-advertise. CD 6/29, under LB.

▲† **Bumstead-Walford Co.**, 55 New Montgomery St., San Francisco, Calif., CA **$1,257,977**. steam test plant at San Francisco Naval Shipyard, NOy 91669, Spec. 50089, SAN FRANCISCO, CALIF. Dist. P. Wks. Office, Twelfth Naval Dist., San Bruno, Calif. Bids June 26, CD 7/10, under LB.

▲ **M & K Corp.**, 405 Montgomery St., San Francisco, Calif., LB **$2,444,830**. wid'n., realigning Market St. and Portola Dr. from Hattie to Corbett Sts., SAN FRANCISCO, CALIF. City and San Francisco Co. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids July 11. CD 6/18.

▲† **Matich Bros. & M. M. Sundt & Son**, P. O. Box 390, Colton, Calif., CA, **$2,596,078**. runway primary and facilities, ENG-04-167-56-42, TRAVIS AIR FORCE BASE, CALIF. U. S. Eng., 1209 8 St., Sacramento, Calif. Bids July 10. CD 7/12, under LB.

BUILDINGS—LB & CA

▲ **Walker Boudwin Constr. Co.**, 624 E. Fourth St., Reno, Nev. CA **$1,411,381**. 3 story, steel AGRICULTURAL BLDG., CA **$561,100**. 2 story ECONOMICS BLDG., RENO, NEV. Bd. Regents, University of Nevada, Morrill Hall, Reno, Nev. CD 6/29, under LB.

▲† **Heftler Constr. Co.**, 9374 Brighton Way, Beverly Hills, Calif., CA **$1,829,000**, 138-unit family HOUSING (Third Increment) with utilities, Inv. 56-202, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 22. CD 6/26, under LB.

▲ **D. M. Drake Co.**, 1600 N.W. Savier St., Portland, Ore., CA **$6,446,404**, est. $6,090,327. two-company BARRACKS, Inv. 56-204, FORT LEWIS, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 25. CD 6/28, under LB.

Wick Constr. Co., 720 N. 35 St., Seattle 3, Wash., CA **$508,284** general contract, JUNIOR HIGH SCHOOL SEDRO-WOOLLEY, WASH. School Dist. 101, Sedro-Woolley, Wash. Bids July 9. CD 7/9, under LB.

▲ **MacDonald Building Co.**, 1517 S. Tacoma Way, Tacoma, Wash., CA **$4,845,720**, COUNTY-CITY BLDG., TACOMA, WASH. University Pl. School Dist. 83, Wash. Bids July 10. CD 7/13, under LB.

Standard Constr. Co., 315 E. 25 St., Tacoma, Wash., CA **$505,000** general contract JUNIOR HIGH SCHOOL, TACOMA, WASH. University Pl. School Dist. 83, 2708 W. Grandview Ave., Tacoma, Wash. Bids Mar. 15. CD 3/22, under LB.

Industrial Building Co., 940 Pacific Hy. N., Eugene, Ore. CA **$575,000**. JUNIOR HIGH SCHOOL, EUGENE, ORE. Eugene School Dist., Eugene, Ore. Bids July 6, awarded July 11. CD 7/16, under LB.

▲ **Pacific Iron & Steel Corp. of L. A.**, 11633 Alameda St., Los Angeles, Calif. CA Est. **$44,000,000**. aluminum reduction PLANT, THE DALLES, ORE. Harvey Machine Co., Inc., 19200 S. Western Ave., Torrance, Calif. CD 11/20/52.

▲ **Hilp Rhodes**, 918 Harrison St., San Francisco, Calif., CA **$1,500,000**. Kahn's DEPARTMENT STORE, in Concord Shopping Center, CONCORD, CALIF. Concord Investment Co., c/o contractor. John S. Bolles, Pier 5, Embarcadero St., San Francisco, archt. Chin & Hendolt, 465 Post St., San Francisco, engrs.

▲ **Oddstad Homes**, 727 Shasta St., Redwood City, Calif., Owner Builds, **$3,074,000**. Unit No. 2, Farm Hill Subdivision, incl. 225 HOMES, REDWOOD CITY, CALIF.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
August 1, 8, 9 British Columbia
STREETS AND ROADS
August 2 British Columbia

BUILDINGS—BA

▲ **Ont., Petawawa**—HOUSING—BA 8/2—Central Mortgage & Housing Corp., 40 Eglinton Ave. E., Toronto, 176 single family dwellings in 350-home housing project, Canadian Army Camp, Total est. $3,500,000.

Ont., **Toronto**—SCHOOL—BA 8/2—Toronto Bd. Educ., 155 College St., 2 story, part bsmnt., H-shaped, 110x360 ft., on sides of H, 230 ft. in between, King Edward Composite School replacement $900,000. Allward & Gouinlock, 57 Bloor St. W., archts. CD 3/1.

Ont., **Toronto**—SCHOOL—BA 8/8—Toronto Bd. Educ., 155 College St., 2 story, 59x260 ft., rein.-con., structural steel, brick, block Ogden School, Over $500,000. Plans deposit $25. Barnett & Rieder, 96 Eglinton Ave. E., archts. Wallace, Carruthers & Assocs., 92 Yorkville Ave., engrs. CD 12/14.

BUILDINGS—SLC

▲ **Que., Montreal**—ADMINISTRATION—Central Metropolitan Market Ltd., 424-A Jacques Cartier Sq., Montreal, soon lets contract 2 story, 50x150 ft., rein.-con. administration bldg., also 1 story, 20x35 ft. comfort station, for central market at Cremazie Blvd. and McEachern Sts. Total est. $15,000,000. Plans deposit $100. G. Paul Brasard, 3711 Dupuis Ave., archt. Beaulieu, Trudeau, Dubuc, Lalancette & Beaulieu, 5810 Cote St., Luc Rd., engrs. CD 11/30.

▲ **Que., Murdochville**—RECREATION CENTER—Gaspe Copper Mines Ltd., c/o Noranda Mines Ltd., Royal Bank Bldg., Toronto, Ont., soon lets contract 2 story, 55,000 sq. ft. recreation center for mine residential development 60 mi. from Gaspe Village. $1,000,000. Allward & Gouinlock, 57 Bloor St. W., Toronto, Ont., archts. CD 7/9.

HEAVY CONSTRUCTION—LB & CA

▲ **ALBERTA**—Alberta Govt., Parliament Bldgs., Edmonton,

W. C. Wells Constr. Co. Ltd., 10519 115 St., Edmonton, Alta. CA, **$623,025**. (6 bidders) grading Trans Canada Hy. from The Gap to Banff, Mile 56.90 to Mile 66.91;

Alta.—**Mannix Ltd.**, 330 7 Ave. S. W., Calgary, Alta. CA, **$972,470**. (5 bidders) grading Trans-Canada Hy. Kananaski River to The Gap, Mile 46.62 to Mile 56.90. Awarded July 11. CD 12/1/43.

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

P. F. Law Constr. Co. Ltd., 500 Beatty St., Vancouver, B. C. LB **$951,568** (5 bidders) Proj. 777, 5.32 mi. Section 2 of Southern Trans-Provincial Hy. Christina Creek-Sheep Lake. Bids July 6. CD 6/25.

Evans, Coleman & Evans Ltd., N. ft. Columbia St., Vancouver, B. C. CA, **$239,000**. (6 bidders) supplying 77,000 lin. ft. c.i. water pipe, VANCOUVER, B. C. City, City Hall, Vancouver, B. C. Awarded July 11. CD 12/18/53.

▲ **Northern Constr. Co. & J. W. Stewart Ltd.**, 1304 Hornby St., Vancouver, B. C., CA, **$1,400,000** 30,000 hp. generating station at LaJoie Dam on Bridge River, Hydro-electric Project, BRITISH COLUMBIA, B. C. Electric Co. Ltd., 425 Carrall St., Vancouver, B. C. Awarded July 11.

▲ **McNamara Constr. Co. Ltd.**, 42 Industrial St., Leaside, Toronto, Ont., and **Canadian Dredge & Dock Co. Ltd.**, Harbor Commission Bldg., Toronto, Ont., CA, **$11,623,200**. dredging Welland Ship Canal, 4 mi. near Port Colborne, Welland, ONTARIO. St. Lawrence Seaway Authority, No. 2 Temporary Bldg., Ottawa, Ont. Awarded July 13. CD 9/9/54.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto,

Ont.—**Storms Contracting Co. Ltd.**, 1 Copeland St., Toronto, Ont., LB **$1,235,957** (5 bidders) Contract 56-78, grading, culverts, gran. base Trans-Canada Hy. No. 17, Marathon;

Ont.—**Greenwood Constr. Co.**, Grand Valley, Ont., LB **$116,455** (7 bidders) Contract 56-80, hot mix paving 9.6 mi. Hy. No. 27, Owen Sound. Bids July 11. CD 7/2.

† **Miron & Freres Ltd.**, 2201 Cote St. Michel, Montreal, Que., LB **$535,200**. pipe line for water intake, municipalities of Longueuil and Jacques Cartier, Lachine Section, St. Lawrence Seaway, QUEBEC. St. Lawrence Seaway Auth., No. 2 Temporary Bldg., Wellington St., Ottawa, Ont. Bids July 10. CD 6/26.

▲ **Key Construction Ltd.**, 1040 Bleury St., Montreal, Que., CA, **$1,289,768**, jetty at Elevator No. 1, Montreal Harbor, MONTREAL, QUE. National Harbor Bd., West Block, Parliament Bldgs., Ottawa, Ont. Awarded July 11. CD 7/6, under LB.

BUILDINGS—LB & CA

▲ **Arthur G. McKee Co. of Canada Ltd.**, 372 Bay St., Toronto, Ont. CA, Total est. **$27,500,000**. design and construct NICKEL SMELTER, CHICOUTIMI, QUE. Eastern Mining & Smelting Corp., 25 Adelaide St. W., Toronto, Ont. Awarded July 13. CD 7/17.

ALASKA

HEAVY CONSTRUCTION—BA

▲† **Alaska**—PAVING APRONS, etc.—BA 8/7—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., paving aprons, Ladd Air Force Base, Inv. 57-8, $1,500,000. CD 11/25/52.

HEAVY CONSTRUCTION—LB & CA

▲† **Patti-MacDonald Constr. Co. & MacDonald-Inter-American Corp.**, 1310 S. Grand Ave., St. Louis, Mo., CA, **$3,679,828**, White Alice installation at Unalakleet, Inv. 56-54, ALASKA. U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash. Bids June 19. CD 6/18, under LB.

FOREIGN

HEAVY CONSTRUCTION—LB & CA

▲ **Impresit South Africa, Ltd.** (Imprese Italiane All'estere Spa), Milan, Italy, CA **$68,000,000** main civil engineering contract for Kariba Hydro Electric scheme, Zambezi River, SOUTHERN RHODESIA, AFRICA. Federal Hydro-Electric Bd., 1 Park St., Salisbury, Africa. Grand total $112,690,000. Bids Nov. 25. CD 9/1/55;

Rhodesia Power Lines, Ltd. (subsidiary of Societe Anomina Elettrificacione), Milan, Italy, CA **$27,000,000**, 330 kv steel power transmission lines; (Southern Rhodesia, Africa);

Boving & Co., London, England, CA **$2,800,000**. 140,000 BHP water turbines (Southern Rhodesia, Africa);

Metropolitan Vickers, Manchester, England, CA **$4,800,000**, 100 megawatt water turbine driven generators (Southern Rhodesia, Africa);

English Electric Co. Ltd., Queens House, Kings Way, London WC2, England, CA **$1,680,000**, 330 kv. power transformers (Southern Rhodesia, Africa);

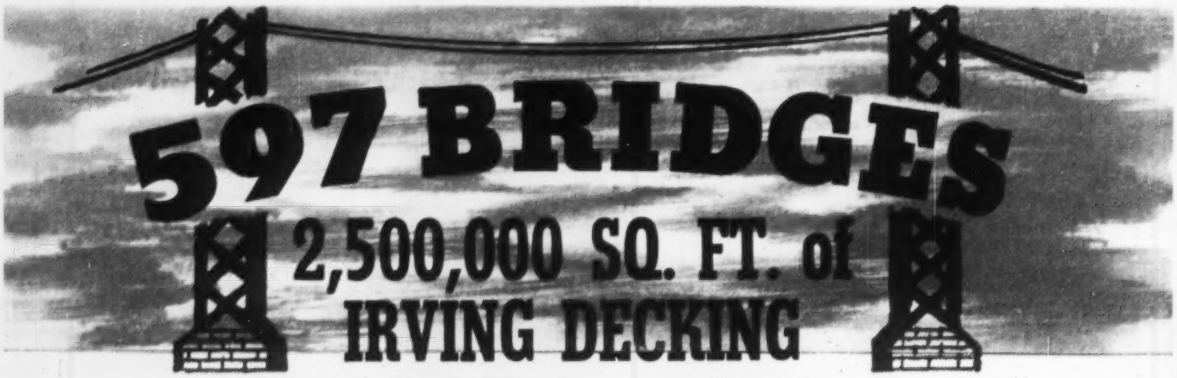
Ferranti, Ltd., 36-38 Kings Way, London WC2, England, CA **$3,600,000**, sub-station transformers (Southern Rhodesia, Africa);

Babcock & Wilcox, London, England, CA **$300,000** overhead electric cranes (Southern Rhodesia, Africa);

Parsons & Co., London, England, CA **$510,000**, shunt compensating reactors (Southern Rhodesia, Africa);

Cementation Co. Ltd., 39-36 Victoria St., London SW1, England, CA **$4,000,000**, preliminary work (Southern Rhodesia, Africa).

(Proposal Advertisement see pp. 106 to 108)



597 BRIDGES

2,500,000 SQ. FT. of IRVING DECKING

Emphasize the Engineering Advantages of Irving Bridge Decking.

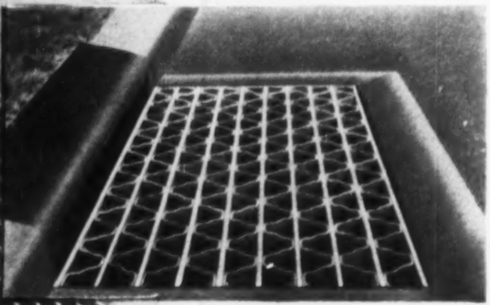
IRVING DECKING is 80% open, self-cleaning and self-draining, non-floating, not affected by wind pressure, lightweight, strong, safe, practically self-maintaining.

ONLY IRVING OFFERS you over 50 years of experience in quality production and sound application of open mesh metal flooring. Take advantage of it! Write for new engineering data catalog covering all fields of application.

"A FITTING GRATING FOR EVERY PURPOSE"

Manufacturers of Riveted, Pressure-Locked, and Welded Gratings.

Sidewalk Grating for Bridges, Gutter Catch Basin Covers, Armourings for Heavy Duty Floors, Trucking Aisles, Loading Platforms, Boiler Room and Plant Flooring, Catwalks, Runways, Stair Treads, Sidewalk Grating, Tree Guards, Balcony Flooring, Airfield Landing Mats.



IRVING "DRYWAY" DRAINGRATES are simple to install, easy and inexpensive to maintain. These safe, clean and strong drain covers are available in Rectangular Mesh and Riveted Types.

IRVING SUBWAY GRATING CO. INC.

ESTABLISHED 1902

OFFICES and PLANTS at

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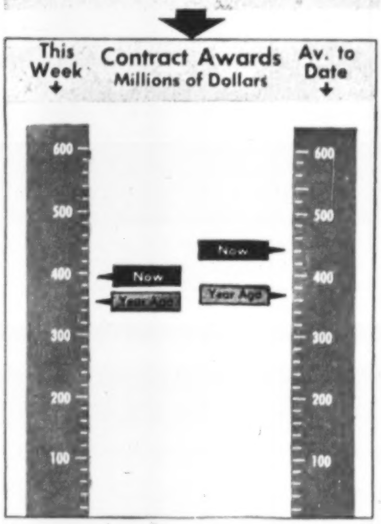
Construction Scoreboard

Activity this Week



AMOUNT OF CONTRACTS LET

By Ownership	This Week	Cum. 30 wks 1956	Chge %
	$ millions		
Federal	$40.7	$1,106.3	+0.1
State and Municipal	115.6	3,795.2	+24
Total Public	156.3	4,901.5	+17
Total Private	240.6	8,297.2	+20
U. S. Total	$396.9	$13,198.7	+19
By Type of Work			
Waterworks	$4.5	$215.8	+40
Sewerage	7.8	346.1	+55
Bridges	8.9	359.7	+30
Highways	51.7	1,401.2	+12
Earthwork, Waterways	2.7	465.9	+46
Buildings:			
Public, Excl. Hosg.	37.7	1,157.2	+13
Public Housing	11.9	256.9	+56
Private Housing	57.9	3,343.3	−12
Commercial	34.2	1,076.5	+4
Industrial	145.3	3,479.3	+117
Unclassified	34.3	1,096.8	−12
U. S. Total	$396.9	$13,198.7	+19

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

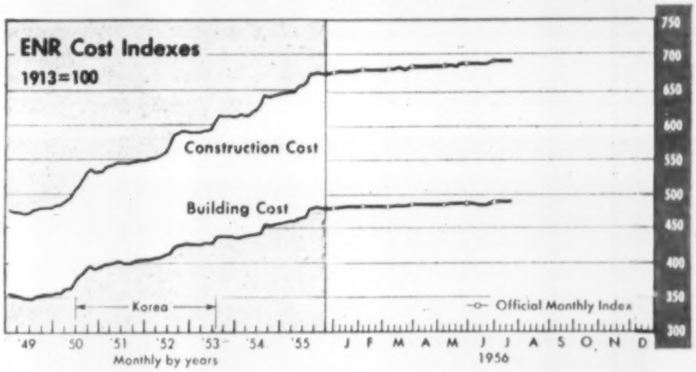
NEW CAPITAL FOR CONSTRUCTION

	Week of July 19	Cum. 29 wks 1956	Chge '55-'56
	$ millions		%
Corporate Securities	$104.5	$2,482.1	+25
State and Municipal:			
All Except Housing	94.6	2,729.7	+12
Housing	...	42.3	−33
Federal Loans	...	78.5	−0.3
Federal Aid	...	1,070.0	+44
Total Nonfederal	$199.1	$6,402.7	+20
Federal Appropriations:			
In U. S.	$16.4	$1,118.5	+145
Outside U. S.	1.0	15.9	−64
Total New Capital	$216.6	$7,537.1	+30

Cost Indexes as of Now

ENR INDEXES (1913=100), 20-cities' average	Week of July 12, 1956	Week of July 19, 1956	% Chg (7-19) from June 21, 1956	% Chg (7-19) from July 21, 1955
Construction Cost	695.75	696.47	+0.5	+3.7
Building Cost	489.84	490.90	+0.5	+2.8

To convert above indexes to 1926=100: Divide Construction Cost by 2.080; Building Cost by 1.845.
1949=100: Divide Construction Cost by 4.770; Building Cost by 3.518



BACKLOG OF PROPOSED HEAVY CONSTRUCTION

	June 30 1956 (millions)	Percent Change from last Month	Percent Change from last Year
Total U. S. (ENR reported)	$100,136	+0.2	+17.7
By Ownership—			
Private	42,912	+0.5	+21.9
State & Municipal	44,315	+0.02	+17.0
Federal	12,909	−0.3	+ 7.6
By Type of Work			
Waterworks	2,066	−0.2	+16.0
Sewerage	3,043	+0.6	+ 3.0
Bridges	2,863	+0.8	+ 6.9
Highways	11,603	−0.8	+ 8.0
Earthwork, Waterways	11,184	−1.0	+18.7
Public Buildings	17,832	+0.6	+13.5
Industrial Buildings	16,026	+0.2	+28.8
Commercial Buildings	17,401	+1.0	+22.4
Unclassified, Private	9,485*	+0.3	+10.9
Unclassified, Public	8,633	+0.4	+31.2
By Regions—			
New England	5,473	+0.5	+10.2
Middle Atlantic	20,973	+0.5	+ 9.7
South	12,090	−0.5	+21.1
Middle West	17,730	+0.2	+20.9
West of the Mississippi	23,215	+0.8	+ 9.8
Far West	20,655	−0.5	+35.7

*Includes private bridges, $90 million.

FLOW OF NEW PROJECTS INTO THE BACKLOG

	1956 June (millions)	1956 6-Months (millions)	Percent Change from '55 June	Percent Change from '55 Year Cum.
Total U. S. (ENR reported)	$1,140	$13,601	−28	+23
By Ownership—				
Private	670	7,359	−35	+47
State & Municipal	447	5,440	−11	− 6
Federal	23	802	−37	+244
By Type of Work—				
Waterworks	18	185	+38	−24
Sewerage	43	245	+10	+24
Bridges	47	272	+ 6	−49
Highways	11	709	−84	−74
Earthwork, Waterways	3	390	−82	+22
Public Buildings	276	2,658	− 1	+70
Industrial Buildings	224	3,395	− 2	+91
Commercial: Mass Housing	197	1,878	−49	+18
Other Building	158	1,402	−47	+17
Unclassified, Private	91	684**	−26	+61
Unclassified, Public	72	1,793	− 7	+326

**Includes private bridges, $13 million.

Construction Feels the Steel Shortage

The Eisenhower Administration, which has shown a reluctance in the past to intervene in labor-management disputes, last week warned that it would act to end the steel strike unless a settlement is reached soon.

President Eisenhower's finger pointing came in the wake of growing shortages of steel in the major construction centers. Even areas which were not alarmed in the early days of the strike now report imminent construction delays and some job stoppages (ENR July 19, p. 27).

Southern cities such as Atlanta and Birmingham caught the brunt of the strike immediately because of the previous shutdown of U. S. Steel's subsidiary, Tennessee Coal & Iron. The situation there grows more serious with each passing day of the strike. But other areas also are suffering.

Cleveland's two largest fabricators, for example, have enough structurals to keep operating for about one more week. Then they will have to shutdown.

Within another two to three weeks, practically all large jobs in the Cleveland area will close down because of the steel shortage. While the biggest problem is lack of structurals, the shortage extends even to bars, wire mesh and tire wires. The local feeling is that steel won't be back in normal supply until at least two months after the strike is settled.

• Small projects "pinched"—Cincinnati's supply picture is slightly different. Large projects that are under way apparently have enough steel to carry them through; smaller jobs already are feeling the pinch.

If the steel strike runs to July 31, many Cincinnati projects that are slated for August completion would be delayed about a month, jobs scheduled for completion in September would be delayed upwards of two months.

Dallas warehouses have little or no structural shapes in stock; fabricators have a three to six weeks' supply. Bar stock is in better supply with both warehouses and fabricators' stocks ranging from three to ten weeks.

The Dallas warehouses are running short of sheet piling, and this will cause some delays. The longest delays will come, however, because of the shortage of structurals.

The Dallas-Fort Worth tollroad offers an example of the seriousness of the steel shortage. After completing foundations for 16 bridges and grade separations, the contractor for one section of the road has been waiting as long as eight weeks for steel. The strike tacks some more time onto the already long waiting period.

• Delays spread in Denver—Warehouse stocks of some reinforcing bar sizes are exhausted in Denver, but fabricators have a month's supply of structurals. Although few construction jobs have shut down, delays are increasing and some work stoppages probably will develop within another week or two.

Detroit fabricators and steel warehouses have a month's supply of heavy structurals and reinforcing bars. However, if the strike runs through Aug. 1, projects now in the planning stage will be in bad shape, according to architects and engineers.

The Detroit expressway program will be set back six months if the strike lasts until July 31. If the strike lasts beyond that date, the big highway program could be delayed as much as a year.

Minneapolis warehouses have few structurals in stock, but they have a seven to eight weeks' supply of reinforcing bars.

• Trouble coming up—One of the biggest steel warehouses in the East, a well known New York firm, has no structurals on hand. And a major fabricator in New York expects to be in serious trouble by the end of the month.

Construction projects that are under way in the New York area seem relatively unaffected by the strike; new starts face delays that will run the length of the strike plus three or four weeks.

Philadelphia also has steel for work under way. Much of this work was scheduled in anticipation of a steel strike and tight supplies. Many projects in the planning stage are being designed for a minimum of steel because of the situation.

Pittsburgh expects the first steel supply pinch to come within a week. By that time, the present stocks on hand of structurals and plates will have disappeared.

St. Louis fabricators and warehouses have no heavy structurals available to new customers; the same situation prevails for reinforcing bars. Construction projects that don't have their steel at the job site probably will close down by the end of the month if the strike hasn't ended by then.

Seattle reports some jobs have been delayed for lack of steel even though the warehouses normally stock a large inventory because of the distance from eastern mills.

San Francisco has a shortage of nails, structural shapes and reinforcing bars and several contractors already have been forced to halt work on projects.

. . . The Strike Affects Canada too

Within four to five weeks, Canada's construction boom (ENR July 19, p. 109), will feel the effects of the U. S. steel strike, even though Canada's own steel industry is not on strike. Reason: Canada has been getting one-quarter of the steel it needs from U. S. mills; it relies heavily on the U. S. for heavy structurals and plates.

If the U. S. strike lasts until the end of July, Canadian construction projects will encounter delays of six weeks or more; the worst steel shortage will develop in the fall. A six-week strike could hold up work on the St. Lawrence Seaway project and the trans-Canada pipeline, which will require 205,000 tons of pipe.

Many Canadians assume that when the strike does end, the U. S. mills will give priority to U. S. projects. As a result, Canadians are showing more interest in European steel, especially if delivery can be assured before the weather sets in to halt navigation on the St. Lawrence in October.

Another effect of a prolonged U. S. strike: Pressure from the Canadian steel industry for higher tariff, to reduce competition from U. S. mills. Presumably this would tend to encourage the Canadian mills to expand their facilities, thereby reducing the impact of any future U. S. steel strikes.

Contractor Wins Bid Fight

Court rules builder made bona fide clerical mistake, says $589,000 error would have bankrupted contractor

The Maryland Court of Appeals has ruled that the City of Baltimore cannot hold the DeLuca-Davis Construction Co. to a low bid on which it made a clerical error of at least $589,880.

As a result of the court's ruling, Baltimore's Board of Estimates had decided to reject all bids opened last Jan. 25 for construction of a 2,500 ft conduit to carry Baltimore's new Jones Falls Expressway under a series of north-south bridges. New bids will be called soon.

DeLuca-Davis, a Baltimore construction firm, submitted a bid of $1,769,064 to build the conduit. This was some $700,000 less than the next lowest bid. It was also well below the cost estimates prepared by the city's engineers.

• Bidder discovers error—Within hours after the bids were opened, DeLuca-Davis announced that there had been an error of $10 per cu yd in listing the cost of unclassified construction.

When city officials balked at proposals that the contractor be permitted to amend the bid or withdraw from the bidding without forfeiting a $50,000 performance check, DeLuca-Davis went to court (ENR Feb. 23, p. 80).

In a suit filed in equity in the Circuit Court in Baltimore, the contractor argued that its error had been made in good faith.

The firm said it would be unjust to force it to lose $400,000 in performing the contract or $50,000 in forfeiting its performance check.

City Courts filed a demurrer, contending that the city's system of sealed competitive bidding would be subverted if bidders could go to court and alter bids or withdraw them without forfeit.

• Lower court favors amendment—The Circuit Court agreed with the city that the bid was irrevocable. But, said the court, the firm should have the privilege of correcting its original bid. And, the lower court ordered the city to accept such an amendment. The city immediately appealed.

Now the Court of Appeals (Maryland's highest court) has completely reversed the Circuit Court. The high court ruled that (1) the original DeLuca-Davis bid could not be corrected and (2) the firm was entitled to the cancellation of its bid and return of its $50,000 check. The Court's reasoning may establish a new precedent in this type of litigation.

• Doesn't meet city's requirements—The Court of Appeals said the bid could be cancelled because DeLuca-Davis was not financially capable of performing the contract in view of a possible $400,000 loss; therefore, the contractor didn't meet the city's own requirements for bidding. Said the Court:

"We need not and do not decide whether on this record, knowledge of which is chargeable to the Board of Estimates, DeLuca-Davis could be determined to be a responsible bidder, although it is difficult to conceive that the Board could in good faith determine that it is.

"The notice of letting provides that 'no contract will be awarded to any bidder who, in the judgment of the Board of Estimates is not a responsible bidder, or is not prepared, with all the necessary experience, capital, organization and equipment, to conduct and complete the work for which the bidder proposes to contract, in strict accordance with all the terms and provisions of the contract documents.'

"DeLuca-Davis has a net worth of $82,000. Obviously it could not stand the $400,000 loss that the performance of the contract would bring, without going into bankruptcy. Pecuniary ability to perform is a vital essential of responsibility.

"If the Board of Estimates intends to declare DeLuca-Davis not a responsible bidder, no harm is done by a decree rescinding the contract and calling for the return of the deposit. Both of these consequences would follow a determination by the Board that DeLuca-Davis was not responsible.

"Whether the Board itself throws out DeLuca-Davis' bid or the court does so, the Board can reject all bids and readvertise, or award the bid to the next lowest bidder who is responsible."

• City has option—The Court of Appeals decree gave the city the alternatives of awarding the contract to the second low bidder, Brooklyn Engineering Co., which had joined the city in its appeal, or of calling for new bids.

City officials who favored awarding the contract to Brooklyn Engineering Co. noted that the firm's bid was in line with engineers' estimates and that construction costs have risen since January.

But against this was the city's policy of rejecting all bids in disputed cases; also considered was the past record which showed the city had often saved money by readvertising a project. Despite protests from Brooklyn Engineering, the board decided to reject all bids and readvertise.

While the original bidders sharpen their pencils for a second try at the Jones Falls Expressway job, lawyers for the construction firm will have time to ponder some of the main points in the court's opinion.

One of the controlling factors apparently was the court's decision that the DeLuca-Davis bid was the result of a mistake that was "bona fide, clerical and mechanical."

The firm presented work sheets on which the cost of unclassified excavation was figured at $13.34 per cu yd. Explained the court:

"On the afternoon before the bid was submitted, the estimator prepared a summary sheet showing all costs of the job, and the bid was written up from this summary sheet. In transferring the estimated unit cost for unclassified excavation of $13.34 per cubic yard from the detail work sheet to the summary sheet, the estimator by mistake entered the figure of $3.34 for Item 2 and Item 11. There seems little doubt that the mistake came about because the first figure in $13.34—the figure '1'—was on a vertical ruled line in the work sheet, apparently accentuated by the paper having been folded . . ."

• One man's mistake—The court cited prior cases to show "rescission for unilateral mistakes" is proper if the mistake is of such grave consequence that to enforce the contract would be unconscionable, if the mistake relates to a material feature in the contract, if the mistake was not due to a violation of a positive legal duty or culpable negligence and if the mistake will not seriously injure the other party beyond the return of the status quo and the loss of a bargain.

The court said the DeLuca-Davis case complied with all these requirements.

(*B&F continued on page 100*)

Housing Doldrums

Starts slide in June, VA appraisals on the decline

The credit-becalmed housing industry showed no signs of getting out of its doldrums last month.

June housing starts totaled 104,000, of which 1,700 were public housing units. The total was down nearly 23% from June 1955 and it trailed even the May 1956 figure.

Despite housing chief Albert Cole's oft-voiced prediction that starts may reach 1,300,000 this year, starts barely stayed above an annual rate of 1,100,000 units through the first half. Last month, they dropped even below that rate.

The Bureau of Labor Statistics said that the seasonally-adjusted annual rate during the month of June was 1,070,000. It was the lowest annual rate of starts reported for any month since January 1954.

Another pessimistic report on housing came from the Veterans Administration last week. VA reported that builders asked the agency to appraise plans for only 35,620 new dwelling units. That was 8,775 less than in May, and nearly 50% under the June 1955 figure.

The VA figure is significant because appraisal requests precede housing starts by several months and therefore serve as an indicator of what's likely to happen. And, the sharp drop in requests for appraisals for VA-insured loans also points up the hardest-hit segment of the housing market—the low-cost homes.

The tight money market may be forcing more home buyers into taking conventional mortgages (at a higher interest rate than the VA-insured loans). If this is so, the year should see a substantial paring of VA's share of the home loan market. Last year, GI loans accounted for 30% of the total mortgage market.

Contractor Prices Up

Austin, Aberthaw indexes climb in second quarter

Faced with rapid increases in wage rates and prices of key construction materials, contractors are raising their prices for new industrial buildings.

Aberthaw Construction Co., Boston, reports its industrial building price index rose a whopping 15 points during the second quarter of this year.

This rise represents a 3.8% increase in the Aberthaw index. It's the sharpest climb since the Korea-inspired inflation of 1950-51.

So far this year, the Aberthaw Industrial Building Price Index has gone up nearly five times as much as it did during all of last year.

Further evidence of a marked boosting of industrial building prices in the second quarter comes from the Austin Company, engineers and builders, Cleveland.

The Austin Company's Industrial Building Price Index went up 2.4% in the April, May, June period. The company attributed the climb to "mounting construction wages and freight rate increases."

Austin's President George A. Bryant also commented that the continuing pressure of companies to get scheduled projects under way has further complicated delivery problems on virtually all major industrial building materials and equipment items.

The second quarter increases in the Aberthaw and Austin indexes come on top of substantial increases in the first three months of this year.

For the first six months, the Aberthaw index is up 5%; the Austin index is up 4.9%. These increases are more than double the corresponding 2.1% increase in the ENR 20-Cities Building Cost Index during the first half of 1956.

Business Briefs . . .

• **Boom in British Columbia**—Construction expenditures in British Columbia are expected to total nearly $840 million this year, according to the Canadian Construction Assn. But CCA President A. Turner Bone warned that the goal might not be met because of shortages of steel and skilled labor, and certain credit restrictions.

• **Supplier does well**—Second quarter sales and earnings for Johns-Manville Corp. were the highest for any three-month period in the company's history. Half-year sales also posted a record. Six-month earnings for the building supply manufacturer totaled $12 million; sales added up to $147.3 million.

• **Penn-Dixie ups profit**—Second quarter earnings of Penn-Dixie Cement Corp. topped the same period in 1955 by 21%. Profits totaled nearly $2.7 million, on sales of $14.7 million.

• **Aluminum record**—Production of primary aluminum in the U.S. set a new six-month mark of more than 860,300 tons, up 13% over the comparable 1955 period. The Aluminum Association predicted that for the year taken as a whole, the producers would set their fifth consecutive production record.

• **New area, new name**—Detroit's Gratiot redevelopment project finally will get under way. The Federal Housing Administration has agreed to insure a loan for the first 22-story apartment building in the project with construction to start around Labor Day. To get away from a "slum clearance" tag, the area will also get a new name—Lafayette Park University City.

• **Coast to coast**—Utah Construction Co., engineers and contractors, headquartered in San Francisco, last week established New York City offices. The new office will coordinate Utah Construction's activities along the whole eastern seaboard.

• **Mortgage meetings**—Reports in recent weeks of easier mortgage money apparently failed to impress the mortgage bankers. MBA, announcing that its 43rd annual convention will be held in Chicago Oct. 8 to 11, said one of the principal subjects will be "the present tight money market."

• **Harbinger?**—Kaiser Steel Corp., still operating despite a national steel strike (its wage agreement runs until Aug. 31) revamped its prices—upward on July 12. Plates, structurals and bars went up $9 a ton.

• **No merger plans**—With financing completed for a $65-million aluminum plant near The Dalles, Ore., Harvey Machine Co. was busily denying rumors last week that a merger was imminent with Cerro de Pasco Corp., one of the world's major mining enterprises.

• **Good customer**—Gas utility and pipeline companies will be good customers for construction for the next three years. A record-breaking total of $1.6 billion is slated for construction this year; an additional $5.7 billion in such work is expected in the next two years.

• **Sales up, profits down**—Allis-Chalmers sales hit $294.3 million in the first half, as against $267 million in the same period last year. But profits were down on a year-to-year basis. During the first half of 1955, Allis-Chalmers made nearly $12.6 million; this year profits totaled $11.8 million. But, A-C's backlog of unfilled orders was up substantially.

For heavy-duty foundations there's no better pile to use than

NATIONAL SEAMLESS STEEL PIPE PILES

No other foundation pile possesses a better combination of load-bearing properties than USS National Seamless Steel Pipe Piles. They give you greater strength with less weight, plus higher loading capacity at less cost. Here's how:

○ **YOU GET MORE STRENGTH WITH LESS WEIGHT** because a circular cross section—which National Seamless Pipe Piles have—is structurally superior to any other shape for compression loading.

○ **NATIONAL SEAMLESS PIPE PILES** give you greater loading capacity because they possess high compressive yield strength without loss of weldability. Piles may be filled with concrete for even greater loading capacity.

○ **NATIONAL SEAMLESS PIPE PILES REDUCE COST** because they can be driven fast through tough formation, and take the punishment of large hammers without brooming. Moreover, they provide positive penetration under rugged driving conditions.

○ **BECAUSE OF THEIR HOLLOW FORM,** National Seamless Pipe Piles can be checked for alignment and condition simply by lowering an electric light into the jetted pile. In open end piles, the bearing area can be checked to assure an even bearing.

Our engineers would like the opportunity to discuss your foundation problems with you, regardless of the type of construction you are engaged in. They might be able to help you save time and money while producing a better foundation.

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NATIONAL SEAMLESS PIPE AND TUBES

UNITED STATES STEEL

Architects for the garage at Washington and Mohawk Streets (above) as well as the other three new parking facilities were James, Meadows and Howard, Buffalo. Consulting engineers were Abbott, Merkt Co., New York City, and the structural engineer was James N. De Serio, Buffalo. General Contractor for the garage shown above was The John W. Cowper Co., Inc. of Buffalo.

New Downtown Parking Garages Relieve Congestion in Buffalo

To help provide adequate public parking facilities in downtown Buffalo, three garages and a market with large roof-parking space have been built under "The Buffalo Plan." By this plan the city constructed the new facilities, then turned them over for operation on a non-profit basis to a corporation composed of the major downtown banks and merchants. Altogether the three garages and the market roof provide parking space for nearly 6000 cars a day.

Bethlehem supplied some 2300 tons of fabricated reinforcing bars for the new facilities. Bethlehem bars, used on so many important concreting jobs, are made exclusively from new-billet steel of known analysis.

Bethlehem reinforcing bars come in size ranges from Numbers 3 to 11, with deformations meeting ASTM Spec. A-305. They are cut to length and bent in our bar fabricating shops, and reach the job site bundled and tagged, with bar lists included, ready for instant placing.

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BETHLEHEM STEEL

Some Big Strikes Are Settled

New contracts break construction tie-ups in California, Louisiana and Texas, pushing labor costs still higher

The construction industry has pulled out of four of its toughest strikes, after boosting labor costs an average of 18.4 cents an hour. The resulting wage gains are in line with the general average construction workers have achieved this year.

In California, Louisiana and Texas, millions of dollars worth of construction were stalled as some of the building trades pressed their demands for higher wages. The results: In California's San Francisco area, carpenters won a 52½-cent increase spread over three years and plumbers came out with a 75-cent package in a three-year contract. In New Orleans, ironworkers and rodmen won 30 cents over two years, and in the Sabine area of Texas pipefitters signed a two-year contract for a 32½-cent increase.

The gains compare with 13.9 cents an hour reported by the Bureau of National Affairs as the average hourly wage gain (exclusive of fringe benefits) for construction workers generally during the first half of 1956. According to that analysis, based on 500 settlements, painters had the lead with an average gain of 16½ cents, with plumbers (15.8), bricklayers (15.2) and ironworkers (14.4) close behind. Teamsters were among the lowest with 12.1 but their fringe benefits were often higher. Contracts for longer than one year occurred in only half the settlements—one-third hit the two-year mark.

• **Pipefitters**—Longest strike of all was in Texas, where members of pipefitters' Local 195 struck the Gulf Coast Piping Contractors Assn. April 2. Lasting 79 days, it triggered off strikes by other Sabine area unions with a general demand for a 6% wage boost —17½ cents in a one-year contract— based on earlier increases granted to petrochemical and refinery employees.

Coming as the first major break in the general strike, the pipefitters' settlement carries an immediate wage increase of 17½ cents an hour, followed by 10 cents more next April and another 5 cents on October 1, 1957. Pre-strike scale was $3.17½.

• **Ironworkers**—Across the Gulf in New Orleans, a ten-week strike of ironworkers and rodmen was one of the costliest in the city's history. Some 10,000 construction workers were idled after the unions walked off their jobs on 40 major projects under construction by members of the Associated General Contractors. Earning $2.97½ and $2.67 cents an hour, respectively, both groups wanted a one-year contract and a 25-cent increase.

Under the settlement, ironworkers and rodmen won a 10-cent boost retroactive to May 1, with two more 10-cent installments on November 1 and next May 1. At the same time, carpenters, cement finishers, bricklayers, operating engineers and other skilled crafts received the same increase in four installments. Laborers, hod carriers, teamsters and semiskilled workers signed for a 17½-cent package under a two-year contract.

The strike was estimated to have deprived construction workers of more than $5 million in lost wages and to have cost building owners as much as $400,000 a month in interest on the $65-million Mississippi River Bridge, daily interest charges were put at $6,200 and the loss in anticipated tolls at $8,000 a day.

• **Plumbers**—Main stumbling block in a two-week strike of 2,000 plumbers in four northern California counties was a non-wage issue—the plumbers' request for a 25-cent hourly contribution by employers for individual savings accounts for use during periods of illness or unemployment. Employers balked at the idea, complaining they might end up subsidizing strikes.

The savings plan was won in principle and the new contract allows one year for working out its details. Commencing next July, employers will kick in 25 cents an hour—it goes into savings accounts if the plan proves workable, otherwise it becomes a wage increase.

Other parts of the 75-cent package are these: an immediate basic wage boost of 25 cents; 10 more cents for fringe benefits on January 1; a 15-cent wage boost in July 1958.

• **Carpenters**—In the same area, 15,000 carpenters scattered through four counties were on strike for a week and managed to split the ranks of the eight employer bargaining groups, five of whom protested they were "sold out" and predicted the 52½-cent increase would have dire effects on the industry.

Dropping their demand for a seven-hour day at eight hours' pay, the carpenters, who received a 10-cent wage boost May 1, asked for another 15 cents plus 10 cents for vacation pay. A neighboring local, Lathers 65, incidentally, had earlier won 70 cents a day for vacation, effective August 1 and becoming $1.00 a day next year.

The settlement that was reached included the vacation payment and added the following items on top of the May increase: a 12½-cent boost as of July 7, raising the scale to $3.12½; another hike of 15 cents (5 cents for wages, 10 cents for pensions) next June; and an additional 15 cents (12½ cents for wages and the balance for pension, health and welfare) in June 1958.

The settlement, said the protesting employer groups, "will cause another inflationary price rise in all types of construction, for this signals only the beginning of labor strife. . . . It will hurt school and other public construction where new bond issues will have to be floated."

Tied into the carpenters' strike was a three-day strike of piledrivers who decided to wait on the outcome of the carpenters' demands. At week's end some 2,000 members in a multi-county area were expected to be given the same raise—plus a provision that will throw most precast work under the pay scales of piledrivers instead of production workers.

Right-to-Work Proposal Is Blocked in Montana

Interest in right-to-work legislation as a political issue gained additional momentum this month with the filing of petitions to put the issue before voters in Montana and Washington.

Efforts have been under way in both states to acquire a right-to-work law by popular vote. Those in Montana have now failed, because the petition contained only 5,636 signatures—more than 15,000 short of the required number. The success of the Washington efforts is still to be determined. Approximately 63,000 signatures were obtained—13,000 more than necessary—but some may be declared invalid.

Right-to-work laws, which generally prohibit discrimination in employment because of union or nonunion membership, are opposed by organized labor as being tools for the destruction of the union movement.

(Labor continued on page 105)

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Highway program gives new dimension to . . .

The Unions' Four-Way Pact

Four of the AFL-CIO building trades have jointly pinned new highway construction hopes on unity and on peaceful settlement of jurisdictional disputes.

In an effort to obtain as much as possible of the construction work generated by the new federal highway program; carpenters, laborers, teamsters and operating engineers are putting increased emphasis on a mutual-assistance plan launched two years ago. Under that plan, the unions are offering union contractors, as an inducement to bid, a pledge not to engage in work stoppages stemming from jurisdictional disputes and hope, in turn, to reap the reward of employment. Principal targets of the union efforts are nonunion contractors and District 50 of the United Mine Workers.

• Machinery—Framework of the joint enterprise, which embraces heavy as well as highway construction, is an agreement entered into by the four unions—the largest in the industry—on the international level in Los Angeles in 1954. It was later implemented by formation of the National Joint Heavy and Highway Construction Committee, which became one of the ardent supporters of the Davis-Bacon provision in the new federal highway program.

Nineteen area committees—14 in the eastern and 5 in the western half of the nation—were established to carry out the policies of the national committee.

• Plan—As restated last May, key points in the committee's four-point policy are these:

"1. Complete unity among the four international unions. All four organizations to be employed on the project.

"2. There shall be no work stoppage on account of jurisdictional disputes. Disputes to be resolved on local level and if unresolved, to proceed to international representatives, and then to national level. All work to proceed while differences are being adjusted."

Information on upcoming work and job lettings is furnished the unions and the area committees by the national committee. The area committees, one of whose tasks is to see that the four trades are employed on projects without discrimination as to any of them, "alert favorable employers to bid on jobs and pledge cooperation" of the unions to the extent specified in the committee policy.

• Autonomy—Wages, hours and working conditions, however, continue to be the responsibility of the local of each organization.

When the plan was explained to members of the area committees, union spokesmen said: ". . . The Committee wishes to state that it does not intend to infringe upon the autonomy of any of the four organizations comprising the Committee. . . . Area committees as such do not have authority to negotiate and culminate agreements. We cannot divest, we cannot take away from the local unions . . . their right to negotiate agreements. . . . On the other hand, the Area Committees should assist the various local unions and district councils in developing these various agreements."

So far, the committee reports it has made "substantial progress" in winning contractor cooperation. It feels it has checked the growth of District 50 in the highway field and that it has reduced the number of nonunion contractors on public works jobs.

Force Account Work

Engineer discusses merits of road work by contract

The high cost of skilled labor and of equipment may bring an end to the use of force accounts on some phases of rural and urban road work.

Writing in the Newsletter of the Dayton Builders Exchange, Licking County (Ohio) Engineer James T. Holden reports that the larger counties in Ohio generally rule out force account construction because of the rigid standards of construction and the number of local contractors available. Smaller counties often use the force account method because of budget limitations and less rigid standards.

Under state law, county commissioners can build roads without receiving bids up to $3,000 a mile. And they are permitted to use the force account method whenever they feel it will enable them to complete a project for less than the bids call for.

Holden described the force account method as generally justified in all counties for construction and maintenance of culverts, small bridges and traffic-bound roads, and, in larger counties, for light surface-treating. But he would rule out the force account method on all work by townships, which he suggests should do more hiring of local contractors.

Except in the larger counties with over 75,000 people, he notes, it isn't economically feasible to carry on large-scale surface-treating programs. Not only is it hard to justify the outlays for equipment frequently idle, but it's also difficult to find skilled operators at the price a county can afford.

U. S. Workers Find the Way To Canadian Pipeline Jobs

Pipeline workers from the United States are using a new device for obtaining high paying jobs in British Columbia pipeline construction, according to the British Columbia Welders Assn.

The association claims U. S. workers are now taking out papers as temporary immigrants in order to qualify for jobs on either the West Coast Transmission Company's 640-mi Peace River pipeline, or B. C. Electric's line from Vancouver to the United States border. It says U. S. workers constitute 25% of the welding force on the pipelines and have most of the better paying jobs.

Pipeline jobs, now being rushed to completion, pay up to $3.20 an hour plus overtime.

The men "have no intention of staying here but because they claim they are immigrants there is no way of stopping them from obtaining work," said one welders' official.

The association claims that local welders, trained by the government, are jobless because preference is given to the more experienced workers from the United States.

Carpenters Start Drive For Members in Hawaii

The carpenters union has assigned a full-time organizer to Hawaii for the first time.

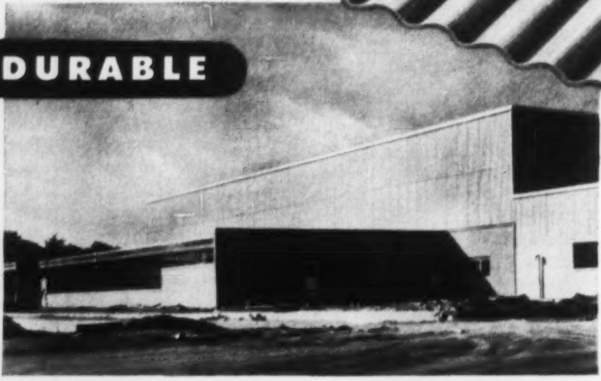
Charles E. Nichols of California will have the job of signing up an estimated 5,000 carpenters working in the territory's construction industry. Only 225 are organized now.

Nichols said he will carry on an educational campaign before trying to close the wage differential between Hawaii and the West Coast.

(Labor continued on page 107)

VERSATILE

Ruberoid Corrugated Asbestos Sheets



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The **RUBEROID** Co.

500 Fifth Avenue, New York 36, N. Y.

Labor Starts to "Educate" in Politics

This month, organized labor is launching one of its biggest campaigns in history for the purpose of electing pro-labor candidates running for public office.

Through a series of six conferences spanning the nation, the AFL-CIO's Committee on Political Education is "educating" rank-and-file members in how to achieve some of labor's goals through the ballot box. Unlike the annual legislative conference of the building trades, the immediate target is the voter instead of the legislator. Emphasis at the moment is on voluntary financial contributions to support the mammoth drive and on voter registration.

Last week, the New England conference—the fourth in the series—was held in Hartford, Conn. Assembled delegates were told that, politically, labor's back is "now against the wall," and that the successful raising of a $15-million campaign fund is "the only way we will be able to elect a liberal Congress."

So far, the "dollar drive"—voluntary contribution of $1.00 from each of the 15,000,000 AFL-CIO members—hasn't "gotten off the ground." Current appeals to members will stress the contribution as "an investment" —an investment "guaranteeing every worker high earnings and good working conditions."

• Registration urged—COPE is simultaneously asking every union member to register as a voter. Present goal is 90%. Labor points to the lesson learned in 1952—election of a Republican Administration—when "we were licked before the election was even held" because too few union members had registered.

The big task will begin later this summer—that of telling every union member which candidates are "friendly" to labor. A four-page publication for each of the states will list 21 different political issues of interest to organized labor and will be distributed at the grass roots with the voting records of senators and congressmen.

The ultimate objective: Election through active and informed voting of candidates sensitive and sympathetic to the aims and purposes of the trade union movement. The AFL-CIO, however, has disavowed any intention of "dictating" or "delivering" the labor vote. And so far it hasn't recommended endorsement of any contenders for the Presidential post, although, at the Hartford conference, COPE co-director Jack Kroll—speaking "only as an individual"—said, "Madison Avenue hucksters, newspapers and politicians are trying to sell the voters a bill of goods in the form of a part-time President."

Meanwhile, both major political parties are out to woo the labor vote. Part of their strategy is to work from within—through use of union leaders as committee heads and advisory groups.

Labor Briefs . . .

• Longer-term contract—Reporting on 923 union contracts signed between June 1955 and May 1956, the National Industrial Conference Board reports that the trend toward longer-term contracts, first appearing in 1950, is continuing, with over half those studied running for more than a year —21.7% were for two and 14.4% for three years.

• FLSA coverage—A federal court has ruled that construction workers replacing a city water main are subject to the provisions of the Fair Labor Standards Act because the work constituted repairs (not new construction) to an existing facility of interstate commerce—water users included railroads and firms that are engaged in interstate business.

• Prison labor—Invoking a 1935 law, Gov. Williams of Michigan has banned use of inmate labor in prison construction at Ionia. The issue had caused a strike of the project by the building trades and an appropriation deadlock developed in the state legislature (ENR July 19, p. 115).

• Jurisdictional dispute—A dispute between electricians and millwrights at six du Pont construction projects in the Wilmington, Del., area has been settled on the international level by dividing the work. Relating to alignment of motors for belt-driven machines, it had threatened to idle 2,000 construction workers.

• Davis-Bacon—The U. S. Labor Department is asking Congress for $500,000 to cover the costs of the new workload imposed on the Solicitor's Office by the prevailing wage provisions of the new Highway Act. It expects to add 40 new members to its regional staffs, 50 more to its Washington staff.

OFFICIAL PROPOSALS

Bids: August 9, 1956.

Proposed Public Improvements
Contract No. G-1-56
Georgetown, Delaware

NOTICE TO BIDDERS

Sealed bids for Proposed Storm Water Drains and Sanitary Sewer Extensions designated as Schedule A and Schedule B, respectively, will be received by the Town Council of Georgetown, at their office located at 116 E. Market St., in Georgetown, Delaware, until 8:00 P.M. (Eastern Daylight Time), August 9th, 1956, at which time and place the bids will be publicly opened and read.

Principal quantities involved are approximately as follows:

SCHEDULE A—PROPOSED STORM WATER DRAINS

10330 Lin. Ft. 12 to 30-inch R.C.C.P. and R.C.S.P. Drains and Inlet Connections; 10,000 Lin. Ft. of Trenches Refilled with Select Materials, 30 Standard Manholes, Types A & B (160 V.F.); 121 Inlets, Types A, B, and C (330 V.F.); 17 Junction Boxes, Types A & B (65 V.F.); 1200 Lin. Ft. Ditches; 4600 Sq. Yds. Macadam Street Repairs; 210 Lin. Ft. Curb and Gutter Replacement; and 180 Sq. Yds. Concrete Sidewalks.

SCHEDULE B—PROPOSED SANITARY SEWER EXTENSIONS

3100 Lin. Ft. 8-inch C.S.P. Sewers; 725 Lin. Ft. 4-inch C.I. House Connections; 3800 Lin. Ft. Trenches Refilled with Select Materials; 12 Standard Manholes, Types A & B (50 V.F.); 10 Special Manholes, Types A & B (50 V.F.); and 150 Sq. Yds. Macadam Street Repairs.

Contractors shall bid on Schedule A and/or Schedule B at their option. Each bid shall be accompanied by a bid bond in favor of the Town Council of Georgetown in an amount not less than five (5) per cent of the total of the schedule or schedules bid.

Plans and Contract Documents may be examined at the office of the Town Council of Georgetown, located in Georgetown, Delaware, or may be obtained from Gardner & Sterling, Consulting Engineers, Calvert and Bond Streets, Salisbury, Maryland, upon payment of $15.00 per set, which amount will not be refunded.

The Town Council of Georgetown reserves the right to retain the bids for a period of thirty (30) days, before making an award. The right is further reserved to consider informal any bid not prepared and submitted in accordance with the provisions of the Contract Documents, and may waive any informalities in or reject any and all bids.

TOWN COUNCIL OF GEORGETOWN
GEORGETOWN, DELAWARE
Harvey B. Spicer, Mayor
John A. Cooper, Ass't Secretary
July 16th, 1956

Bids: August 21, 1956

Construction of Interceptor

Sealed bids for Construction of Ohio River Interceptor, Section "A" in Jefferson County, Kentucky, will be received at office of Metropolitan Sewer District, 412 W. Market Street, Louisville, Kentucky, until 12 noon Central Daylight Saving Time on August 21, 1956, at which time they will be publicly opened and read. Project includes construction of about 1,650 lin. ft. of 11 ft. semi-elliptical, reinforced concrete sewer, about 425 lin. ft. of 48 inch reinforced concrete pipe; an underground sewage diversion structure approximately 40 ft. by 60 ft.; and appurtenant work. Portions of sewer and structure involve tunnel work.

Plans, specifications and information for Bidders will be available Monday, July 23, 1956, at the office of the District, or may be examined at the offices of Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., which will be furnished to prospective bidders upon the deposit of $50.00 for complete set of Plans and Specifications. Said deposit will be refunded upon return of the Plans and Specifications in good condition within 30 days of the date of opening of bids.

Bidder's proposal must be accompanied by a certified check in an amount of Fifty Thousand ($50,000—) Dollars, on Louisville, Kentucky, or New York City Banks, payable to the Metropolitan Sewer District.

The District reserves the right to reject any or all bids or waive any informality in any bid and to accept any proposal considered by the District to be on the whole, the best.

LOUISVILLE & JEFFERSON COUNTY
METROPOLITAN SEWER DISTRICT
Louis J. Herrmann, Sr.
Chairman

OFFICIAL PROPOSALS

Bids: August 8, 1956

Triborough Bridge and Tunnel Authority

SEALED BIDS WILL BE RECEIVED BY Triborough Bridge and Tunnel Authority at its office Administration Building, Randall's Island, Manhattan, New York 35, N. Y., as follows:

Until 11 a.m. on Wednesday, August 8, 1956.

For Contract No. WB57, Painting the Bronx-Whitestone Bridge and Incidental Structures, Boroughs of the Bronx and Queens, City of New York.

Each bid must be accompanied by a deposit in the amount of twenty thousand Dollars ($20,000).

Specifications, bid and contract form may be purchased at the office of the Authority for $10.00. The purchase price will not be refunded.

All information may be obtained at the office of the Authority.

Bids: August 23, 1956

City of Elizabeth, New Jersey

NOTICE TO BIDDERS

Sealed proposals for the construction of Storm Drains in connection with Storm Drainage Relief Project for the Northwesterly area in the City of Elizabeth, will be received by the Board of Public Works of the City of Elizabeth, New Jersey, at a meeting to be held in the Council Chamber at the City Hall at 2:00 P.M., E.D.S. Time on Thursday, August 23, 1956, and then publicly opened and read. No proposal will be accepted after said hour. Proposals will be received on each:

Contract I: Construction of Storm Drains and Appurtenances on Newark Avenue, Alina Street, Fanny Street, etc., to foot of Alina Street.

Contract II: Construction of Storm Drains and Appurtenances on Alina Street, Cross Avenue, Lower Road to Newark, etc. to Weequahic Lake.

Information for Bidders, Proposal forms, specimen Contract, Plans, Specifications and other pertinent Contract Documents for any or all of the foregoing contracts may be examined at the office of Alexander Potter Associates, Consulting Engineers, 50 Church St., New York, and at the office of the City Engineer, City Hall, Elizabeth, N. J., between the hours of 10 A.M. and 4 P.M. daily except Saturdays, Sundays and holidays and there obtained upon making a deposit of Fifty ($50.00) dollars, which will be refunded to bidders within thirty (30) days after the proposals are opened and upon return of the data undamaged. Half of this deposit will be refunded to non-bidders.

Extra copies of specifications may be obtained at the cost of Ten ($10.00) dollars each and extra sheets may be obtained at the cost of One ($1.00) dollar each which sums will not be refunded.

Bidders may submit proposals for each contract or a combination bid for both contracts.

The scope of work under each contract is as follows:

CONTRACT I: Approximately 3000 lin. ft. of reinforced concrete culvert pipe varying in size from 15-inch to 42-inch diameter, approximately 4700 lin. ft. reinf. concrete culvert pipe varying in size from 48 to 72-inch diam., approx. 500 lin. ft. of asbestos-cement pipe 10 to 18" diam., approx. 400 lin. ft. of vit. clay pipe 10-12" diam., 26 manholes, 52 curb inlets and catch basins, one siphon of reinf. concrete, 5 overflow M.Hs. of reinf. concrete, 5300 lin. ft. pavement, reconstruction of gas & water utilities, etc.

CONTRACT II: Approximately 5400 lin. ft. of reinforced concrete culvert pipe varying in size from 15" to 42" diam., approx. 2600 lin. ft. reinf. concrete culvert pipe 60" diam., approx. 1000 lin. ft. 48x76 reinf. concrete pipe, 30 manholes, 49 catch basins and curb inlets, 6600 lin. ft. pavement, 1600 sq. yds. concrete pavement, reconstruction of gas & water utilities, etc.

Prospective bidders will be required to fill in answers in Questionnaire of Financial Statement which is authorized by State Law and which must be approved by the Board of Public Works before bidders are eligible for bidding. Questionnaire forms may be obtained at the office of the City Engineer.

No proposal shall be considered unless accompanied by a bid bond of a corporation acceptable to the City, or a cashier's check or a certified check upon some good and acceptable bank, in the penal sum of 10% of the total amount of each bid as a guarantee that if the contract upon which the bidder has bid shall be awarded to said bidder, he will enter into a contract for the work and do so within the time stipulated in the Notice of Award for said work and failing to do so the bidder and surety shall forfeit to the City of Elizabeth, the amount of said Bid Bond or check. The Bid Bond shall be executed by the bidder and surety company on form furnished by the City.

A bidder to whom a contract is awarded shall furnish a Performance Bond on a surety company duly licensed in the State of New Jersey, in the sum of 100 per cent of the amount of the contract, conditioned upon the faithful performance of the terms of the contract.

The successful bidder will be required to comply with all State Laws governing the execution of Municipal contracts in the State of New Jersey.

The Board of Public Works reserves the right to reject any and all bids as it may deem best for the interests of the City of Elizabeth, and to waive any informality in the bid.

BY DIRECTION OF THE
BOARD OF PUBLIC WORKS
Robert S. Everett
Clerk, Board of Public Works

July 12, 1956

Bids: August 9, 1956

Walt Whitman Bridge Contract No. 9

DELAWARE RIVER PORT AUTHORITY
of the
COMMONWEALTH OF PENNSYLVANIA
and the
STATE OF NEW JERSEY
Administration Building
Camden, New Jersey

Sealed bids will be received for "Asphaltic Concrete Pavement on Structures between the west abutment at Front Street in Philadelphia, Pa., and the abutments in the vicinity of the North-South Freeway in Gloucester, N. J.," known as Contract No. 9, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey until 2:30 P. M. Eastern Daylight Time, Thursday, August 9, 1956, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon the deposit of $10.00 check, which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $20,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor and Materialmen's Bond in the sum of 100 percent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4707) will be received at Sacramento, California, until September 5, 1956, for furnishing labor and materials for 69 Kilovolt Capacitor Installation at Folsom-Elverta Terminal Switching Facilities, Central Valley Project, California. Location near Elverta, California. Principal items are 440 cu. yds. excavation; 210 cu. yds. concrete; furnishing and erecting 24,000 pounds steel structures; installing duplex control board section CHA 26; installing two 69-kv, 25,200-kvar, outdoor, power shunt capacitor equipments; and other work. Completion time 150 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4735) will be received at Medford, Oregon, until August 28, 1956, for furnishing labor and materials for Earthwork, Pipe Lines, and Structures for Yankee Creek Siphon and Antelope Creek Siphon and Wasteway, Medford Canal Rehabilitation, Rogue River Basin Project, Oregon. Location near Medford, Oregon. Principal items are Yankee Creek siphon, concrete, 60-inch diameter, and about 1,940 feet long; Antelope Creek siphon and wasteway, concrete, 60-inch diameter, and about 155 feet long; and other work. Completion time 200 days. For particulars, address Bureau of Reclamation, P. O. Box 629, Medford, Oregon; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4722) will be received at Weaverville, California, until August 14, 1956, for furnishing labor and materials for Streets, Utilities, Residences, and Miscellaneous Buildings for Trinity Government Community Facilities, Trinity River Division, Central Valley Project, California. Location near Lewiston, California. Principal items are 120,000 cu. yds. excavation; 12,600 lin. ft.—furnishing and erecting wire-mesh type fencing; 34,500 lin. ft.—excavation and backfill of pipe trenches; 15,500 lin. ft.—furnishing and laying 4-, 6-, and 8-inch diameter sewer pipe; 9,325 lin. ft.—furnishing and laying 6-, 4-, and 3-inch diameter water pipe and fittings; 170 tons—liquid asphalt MC-2 and MC-4; 90 buildings—constructing two and three bedroom residences; 8 buildings—constructing miscellaneous building; 146 carports—constructing carports of various sizes; and other work. Completion time 360 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; Weaverville, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4732) will be received at Lindsay, California, until August 23, 1956, for furnishing labor and materials for Shafter-Wasco Laterals and Sublaterals; and completion of Laterals 134.4 and 137.2, Shafter-Wasco Irrigation District, Central Valley Project, California. Location near Wasco, California. Principal items are earthwork for and furnishing and laying 26 miles of concrete pipe, 27 inches and larger, under Schedule No. 1; and 82 miles of pipe, 24 inches and smaller, under Schedule No. 2. Diameters vary from 12- to 72-inches with option for use of asbestos-cement pipe for diameters of 24 inches or less. Work includes installation of pumps, valves, meters, and other work. Completion time 650 days. For particulars, address Bureau of Reclamation, P. O. Box 525, Lindsay, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Department of Commerce, Bureau of Public Roads, July 11, 1956. SEALED BIDS will be received at the office of the Bureau of Public Roads, c/o Acadia National Park Office, Bar Harbor, Maine, until 11:00 a.m., E.S.T., AUGUST 10, 1956, for the construction of Project 4A2, Acadia National Park, Hancock County, Maine. 2.252 miles Grading, Draining, Hot Asphalt Concrete Paving and other work on the East Side Loop Road. The approximate quantities of the most important items are 63,150 cu. yd. Excavation, 5,500 tons Type I-1 Hot Asphalt Concrete Pavement, and 800 cu. yd. Cement Rubble Masonry. Minimum wage rates have been fixed as required by law. Plans, specifications and proposal forms are available upon request at the Bureau of Public Roads offices, c/o Acadia National Park Office, Bar Harbor, Maine, or 1440 Columbia Pike, Arlington, Virginia. H. J. Spelman, Division Engineer.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4733) will be received at Winters, California, until September 5, 1956, for furnishing labor and materials for Putah South Canal, Station 338+85.12 to Station 1017+00; and McCoy Creek Wasteway—Solano Project, California. Location near Vacaville, California. Principal items are 1,200,000 cu. yds. excavation; 27,900 cu. yds. concrete in canal lining; 3,800 cu. yds. concrete in structures; and other work. Completion time 600 days. For particulars, address Bureau of Reclamation, P. O. Box 546, Winters, California; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

EMPLOYMENT OPPORTUNITIES

The Advertisements in this section include all employment opportunities—executive, management, technical, selling, office, skilled, manual, etc.

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INLAND IS EXPANDING! Last year we doubled the size and Staff of our modern, air-conditioned Architectural Drafting and Engineering Department. You can share in this growth. Unusual, challenging, permanent opportunity with excellent chances for advancement. Duties involve preparation of quantity surveys of floor, roof, wall and interior partition panels. Also to assist in development of details and preparation of drawings for special application of our building materials. Estimating experience essential.

The man who qualifies will enjoy the advantages of our pension, hospitalization and life insurance programs. Numerous employee recreational activities add to the friendly attitude Inland people share.

For an interview with us, give details of your work experience, job interests, education, age, marital status and salaries received.

INLAND STEEL PRODUCTS COMPANY
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Permanent openings in our St. Louis and San Francisco offices for qualified personnel experienced in design of structural steel and reinforced concrete for work on

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Openings also available for mechanical and electrical designers and draftsmen for work on power plants, test facilities, large electrical installations and general industrial projects. Several recent graduate engineers will be added in all categories.

We desire men who want long range employment with ample opportunity for professional development and advancement. Excellent Employee Benefits & Retirement Plan, generous annual leave and sick leave, Blue Cross, paid holidays.

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400 W. Madison St.
Chicago 6, Ill.

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ENGINEERS DESIGNERS DRAFTSMEN

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and
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Fields of

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Engineers, Designers, and Draftsmen having qualifying experience in one or more of the above fields, please submit complete resume listing education, experience, salary history, present salary requirement, and availability date to:

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Engineers - Constructors

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Industrial steel and reinforced concrete design.

2

Furnace and pressure vessel equipment design.

Responsible positions with a long-range future are immediately available. Recognizing the need for the professional growth of the individual engineer, Kellogg provides a variety of stimulating assignments and encourages membership in engineering societies and associations. As a result, the company has grown steadily for 55 years to become a world-wide leader in the petroleum and chemical plant field. The most modern facilities are available in a brand new air conditioned building, centrally located convenient to transportation serving suburban residential areas.

Please send resumes, including salary requirements, to R. L. Stacom. All inquiries in confidence.

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College graduates with minimum 6 years' work experience in industrial engineering, cost analysis or related activities. To provide industrial engineering services ranging in scope from shop layout to organizational changes in major oil producing operations.

Write, giving full particulars regarding personal history and work experience. Please include your telephone number.

Recruiting Supervisor, Box 93

ARABIAN AMERICAN OIL COMPANY
505 PARK AVENUE
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OVERSEAS

Immediate Openings

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Must have degree or Equivalent plus min 8-10 years design experience. $8736 to $12,480 plus overtime.

Living allowance covers entire cost of board and room. Sick and vacation leaves.

P-2382, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N.Y.

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Fine opportunities for a number of qualified men. Civil engineering on large industrial projects—oil refineries, chemical plants, ore-processing facilities and power plants. Top salaries. Profit-sharing retirement plan. Paid insurance and other major company benefits. Away from downtown traffic. Air-conditioned private and semi-private offices. Fine restaurant. Reimbursed advanced education. Practice your profession in an environment for steady growth.

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our Personnel Department,
Mr. F. B. Stratford

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ENGINEERS
CONSULTANTS CONSTRUCTORS

Planning Engineer

The Engineering and Construction Division of The Sherwin-Williams Company desires to employ engineer with M.E. or Ch. E. degree who has had a great deal of experience in engineering phases of the chemical industry such as construction, maintenance, piping, installations, layouts, etc., as well as supervisory and administrative ability. Must have potential to become departmental engineering supervisor.

Planning Engineer has charge of new installations; modifications of present installations; prepares plant requisitions; supervises Project Engineers, Field Engineers and Draftsmen; assists in developing better methods; supervises repairs, maintenance and overhauling of equipment, as well as many other engineering functions.

The position is located at Chicago, Illinois (Southern section of the city). It is one of promotional opportunity. Salary commensurate with qualifications. Please state age, experience, education, salary requirements and other information. All replies confidential.

Lewis J. Ringler
Industrial Relations Department
The Sherwin-Williams Company
101 Prospect Ave., N.W.
Cleveland 1, Ohio

SALES ENGINEERS

A major steel company has need for sales engineers to promote and sell fabricated products in middle Atlantic states. Excellent opportunities for men 25 to 30 years old with engineering background and a desire for sales work. Attractive starting salary with company car, expenses and bonus plan.

P-8324, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED REPRESENTATIVES

Manufacturer located in central New Jersey desires representation in New England, South Atlantic, and South Central for line of Joint Sealers, Concrete Curing and Caulking Compounds. Must have contact with Contractor Equipment Dealers, Contractors and Engineering Constructors. Write qualifications and present representation if handling under five or six lines only.

RW-2292, Engineering News-Record
Classified Adv. Div., P.O. Box 12, New York 36, N.Y.

REPLIES (Box No.): Address to office nearest you
c/o This publication Classified Adv. Div.
New York: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Assistant Professor—To teach undergrad courses in structures and applied mech. Salary depends on qualifications of Civil Eng., Univ. of No. Dakota. Grand Forks, N. Dak.

Accountant . . . able to fill responsible position in main office of medium size construction firm. Prefer man in early 40's with experience in construction accounting. Located in central Connecticut. Send full details and salary requirements. Reply P-2176, Engineering News-Record.

Asphalt Batch Plant & Laydown Inspectors. Also, soils lab. tech.—O'seas Airbase, mild climate. Call or write Mr. Lambert, Patchen & Zimmerman, 120 Greenwich St. NYC RE2-4187.

Civil and structural engineers by consultant on buildings, bridges and highways. Excellent opportunity for several well qualified men. Box 121, Station H, Toledo, Ohio. Replies acknowledged.

Engineers for municipal and industrial water supply, sewerage and treatment projects. Opportunities for permanent connection with long established firm of consulting engineers in mid-west. Both E.I.T.'S and engineers considered. Full information and references in first letter requested. P-2316, Engineering News-Record.

Road Construction Superintendent. Southern Connecticut area. All types of road construction, preferably asphalt. Please state qualifications. All replies held confidential. P-2348, Engineering News-Record.

Civil Engineers to work with consulting engineering firm. Long established municipal consulting firm desires to secure civil engineers for permanent positions. Experience in some phase of municipal Engineering required. Offices located in very desirable small college community in Colorado area. Expansion of firms operations provide unlimited opportunities for advancement for properly qualified engineers. Firm desires to employ engineers with from one to fifteen years experience. Salaries $5,100 to $7,200. Please give experience and full details in reply. Replies will be held confidential if requested. P-2374, Engineering News-Record.

Construction Executive: Fully qualified. Seventeen years in all phases of commercial and industrial construction. Estimating to completion, contract negotiation, project management. Age 40. Domestic or foreign. Seek new permanent connection with possible future advancement. Minimum $14,000. P-2360, Engineering News-Record.

Civil Engineers, Designers, Draftsmen experienced in the design of sewers, pumping stations, sewage treatment plants, water supply systems, structural and hydraulic design, hydraulic computations, specs. O'Brien & Gere 400 E. Genesee St., Syracuse, N. Y.

Registered Engineer with minimum 5 years experience in tunnel construction to act in capacity of safety engineer for Ohio sewer project. Familiarity with compressed air construction and all safety methods essential. Please state full qualifications, experience, references and salary requirements in first letter. P-2221, Engineering News-Record.

Highway and Bridge Designers and Draftsmen needed for work in Rhode Island area. Send experience record to P. O. Box 752, Providence, Rhode Island.

Wanted Civil Engineers as resident engineers on large sewage project involving sewage treatment plant, pumping stations, and 63½ miles of intercepting sewers including 30 miles in tunnel. Must be experienced. Give full particulars and salary first letter. Allegheny County Sanitary Authority, 701 Civil Building, Pittsburgh 19, Pennsylvania.

Associate Professor of Civil Engineering—BS & MS in Civil Engineering to teach engineering mechanics, surveying, highway & reinforced concrete. Salary $5400 for nine months. Location—Texas. P-2297, Engineering News-Record.

Graduate Civil Engineer, Architectural Engineer, or Architect with experience in building construction to make quantity surveys of building materials. Interested in man desiring to locate in Wichita, Kansas, permanently. Martin K. Elby Construction Co., Inc., 610 N. Main, Wichita, Kansas.

POSITIONS VACANT

Wanted: Civil Engineers for permanent work on bridges in both design and field offices of established consulting engineer. Please send education and experience resume, references, and salary rquirement. P-2368, Engineering News-Record.

Superintendent of Public Works: Registered New York State. 5 - 10 years experience municipal engineering, and/or utility engineering. Will supervise and assist, small but growing western New York State village in all engineering matters including design, layout and inspection of construction of streets, sewers, buildings, and sub-divisions. Will manage Water & Light Department, including electric generation, water treatment and steam heating distribution. Salary $7500 to $10,000 based on experience. P-2313, Engineering News-Record.

Engineers—Civil, Hydraulic, Dam, or Soils Chief, Dams Division, minimum of ten years responsible engineering experience in the design and construction of dams. Applicant must be familiar with soil mechanics foundations, hydraulics, hyrology, and construction procedures. Will be responsible for program involving inspection of existing dams, processing applications for permits to build dams, dam analysis and reviewing dam construction procedure. Chief, Design Branch, minimum of eight years responsible engineering experience in the design of flood control or related type projects. Applicant must be familiar with soil mechanics, hydraulics, hydrology, and concrete design. Will supervise design groups engaged in design of flood control projects, preparation of preliminary reports and construction drawings. Design Engineers—Civil, Hydraulic, and Soils engineers with no experience to extensive experience in respective fields. Work includes broad phases of hydraulics, hydrology, soil mechanics and concrete design on local flood protection projects. Broad experience available in planning, design and construction of projects. Civil engineers with construction experience on hydraulic structures also required. Dam Engineers, minimum of four years experience in the construction and/or design of dams. Applicants should have a working knowledge of soil mechanics and concrete control. Duties involve review of plans and specifications, field investigations and inspections and design analysis. Location and Salary — Pennsylvania. Salary commensurate with experience with range of $4524 to approximately $9000 per annum. Fringe benefits including vacation, sick and holiday leave, travel expenses and retirement system. State education, experience, age, salary expected and references. Address replies to P-2381, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Assistant Chief Engineer—Maryland Public Service Commission in Baltimore. Degree in engineering and 5 yrs' engineering exp. (2 yrs in supv. capacity). Salary range $5966-7156—contact Commissioner of Personnel, 31 Light St., Balto, 2, Md. by Aug. 10th.

Construction Mgr. CE. Must have metropolitan labor following, ability to run multi-million business for Bergen Co. builders. Write details, salary. P-2440, Engineering News-Record.

Engineering graduate with experience in the testing and control of placement of soils, concrete or asphalt mixtures for work immediately abroad and in New England for an old established engineering organization. Give full details of experience and education. Salary range $6,000. to $10,000 per year. P-2356 Engineering News Record.

Building Structural Engineers. New York State residency required. Six openings at Assistant level, $5660-6940. C.E. degree and 2 years experience in the development of structural details in the design of buildings; or an equivalent combination of experience and training. Four openings at Senior level, $6890-8370. New York State P.E. license and 2 years in the design or review of structural features for steel and concrete buildings. Filing closes September 7 for October 6, 1956 examination. Write for details to Recruitment Office, New York State Civil Service Department, Albany, New York.

Structural Engineer-Registered Civil Engineer for concrete additive franchised sales and service organization. New product. Building knowledge necessary. Salary, expenses and bonus arrangement. P-2115 Engineering News Record.

General Superintendent to handle a wide variety of projects in Chicago, Illinois including expressways, grade separations, and widening and paving city streets. Medium sized, growing firm needs top notch man to relieve chief engineer of outside duties. May handle one large project or several smaller projects. P-2446 Engineering News Record, 520 N. Michigan, Chicago 11, Illinois.

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DESIGNERS
DRAFTSMEN
Drainage Engineers

FOR OFFICE WORK IN ST. LOUIS ON HIGHWAYS EXPRESSWAYS AND ASSOCIATED CIVIL WORKS

- *Permanent employment for qualified men*
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Plus: Employee Benefit and Retirement Plan, Paid Vacations, Holidays, Sick Leave. Blue Cross available.

PLEASE WRITE FULLY TO OR INQUIRE AT

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1134 LOCUST ST. ST. LOUIS 1, MO.

HIGHWAY ENGINEERS
STRUCTURAL ENGINEERS
SOILS ENGINEERS

Permanent Positions available for experienced engineers or recent graduates in the Soils, Structural and Highway Design Departments of our New Jersey Office.

Immediate Openings — Liberal Employee Benefits
Salary Commensurate with Qualifications

In reply submit complete resume of experience and personal history including salary requirements.

Personnel Dept., **EDWARDS, KELCEY and BECK**, 3 William St., Newark, N. J.

Engineers Architects

Highway—Bridge
Designers—Draftsmen
Soils Engineer
Irrigation Designer
Construction Engineer (Irrigation)
Architectural Designers—Draftsmen
Ink Tracers—Computors
Civil Engineering Draftsmen

Air Mail Resume TO R. L. SHAW, *Personnel Director*

MICHAEL BAKER, Jr., Inc.

BAKER BLDG. *Consulting Engineers* ROCHESTER, PA.

ENGINEER

(CIVIL—OVERSEAS)

HIGHWAY MATERIALS and TESTING ENGINEER

Position: In charge of modern highway testing laboratory and materials survey in Near East.

Requirements: 15-20 years experience. Ability to organize and direct a country wide materials survey and train personnel in testing operations.

Top salary—good living conditions—liberal benefits including paid transportation for wife.

P-1812, Engineering News-Record
330 West 42 St., New York 36, N. Y.

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CONCRETE & STEEL
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QUALIFIED MEN—
Exp'd in industrial construction, to join a YOUNG and GROWING organization serving the iron & steel & related industries.

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2 — SOILS ENGINEERS — Master's degree preferred — at least 10 years practical experience, emphasis on bridge foundation and highway soils work.

2 — SOILS TECHNICIANS — at least 3 years practical experience.

2 — CONCRETE ENGINEERS — heavy experience in design and control of concrete mixes.

1 — BRIDGE ENGINEER — heavy experience on field inspection and layout.

Projects starting approximately September 1, 1956. Can lead to permanent management position in well established growing company. Many employee benefits. Salary open. Send complete resume and photo to:

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Villa Park, Illinois

Southern California

Field Engineer	$587
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Resident Engineer	$507
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Periodic Salary Increases
Also Annual review of salaries
Paid vacations, sick leave, holidays
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236 Third Street
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Permanent Positions
in Center City, Phila.

Company benefits, pension plan, hospitalization, insurance, etc. 36¼ hours. Salary open.

Submit resume stating education, experience and salary.

AMERICAN WATER WORKS SERVICE CO.
3 PENN CENTER
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AIR POLLUTION CONTROL OFFICER

(Southern California)

New Position; New and Growing Field
$647 start; periodic increases to $786
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Paid vacations, sick leave, holidays
Part-paid health insurance, retirement
College and four years engineering experience
Equivalencies acceptable

Write

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Field Engineers, Designers and Draftsmen. Pleasant working conditions. Interesting projects. Qualified graduates may apply in person or write fully stating education and experience.

D. B. STEINMAN, *Consulting Engineer*
117 Liberty St. New York 6, N. Y.

ACCOUNTANT
For General Contracting Firm

The man we are seeking is presently employed with a small General Contracting and Building firm and desires to make a change for a future with a larger old established firm operating east of the Mississippi River. He must have ambition, be dependable, sober and have a pleasant personality so as to meet and talk with people. He should have proven business acumen and be able to supervise and handle personnel. His experience should consist of Office Management and general supervision or handling of the overall accounting procedures. Age 30 to 35. College graduate in Business Administration preferable. If you believe you can qualify, write and give complete resume, including references and experience.

P-2307, Engineering News-Record
Class. Adv. Div. P.O. Box 12, N.Y. 36, N. Y.

ASSISTANT CHIEF ENGINEER

CE or Arch. experienced in structural steel, steel design, detailing, checking and estimating to understudy for chief engineer job with outstanding central Ohio firm. $8500. NO FEE. Submit detailed resume and photo to Personnel Associates, 83 South High Street, Columbus 9, Ohio.

WANTED

Sales Engineer for crawler type tractor and loading equipment. Excellent opportunity for aggressive and experienced sales person. Progressive and growing manufacturing organization.

THE EIMCO CORPORATION
3140 Fayette Avenue
Birmingham 8, Alabama

POSITIONS VACANT

Designers—Steel, Concrete, Electrical Piping, Air-Cond., Power Plants & Industrial Bldgs. Marberry Corp., 120 Greenwich St. N.Y.C. Rector 2-3749.

Wanted Civil Engineer experienced in Municipal Engineering. Liberal Benefits, including annual wage increase, paid vacations, sick leave, retirement plan and social security, group life insurance, sick and hospital benefits. Contact Superintendent Public Works, City of Keene, New Hampshire.

Grad. Civil Engineer with three years road construction exp. Pref. Western States resident, age 25 to 45. Salary range, $531-646 mo. With less experience, salary range, $459-558 mo. Retirement, sick leave, vacation, good opportunity for advancement. Send brief resume of education, exp. etc., to Personnel Dept., Court House, Ventura, Calif.

Asphalt Superintendent—permanent job for real superintendent. Must have lay down and plant experience. Record of accomplishment as superintendent equally as important as amount of experience. Initial assignment Florida Turnpike. Wage normal to Florida Highway work. P-2227, Engineering News Record.

Experienced Steel Detailer for checking shop details in contractor's office. 40 Hour week at $5.00 per hour. Location: Washington, D.C. Roscoe Engineering Corp. & Associates, 1107-19th Street NW, Washington 6, D.C. Attn: Chief Engineer.

Equipment superintendent—Master mechanic to supervise repair of equipment in Main Shop of progressive construction organization. Permanent position with good opportunity for right man. State previous experience. Salary open. P-2449 Engineering News Record.

Graduate Civil Engineer—Preferably experience in road, bridge, and drainage design, for position in the Public Works Department of Anne Arundel County, Maryland. Submit with application resume of experience and salary desired. E. R. Lonergan, County Business Manager, Anne Arundel County, Maryland. Box 506, Annapolis, Maryland.

POSITIONS VACANT

Construction Superintendent to work as assistant to General Superintendent. A paving and bridge contractor doing $10,000,000 annually working in the middle west is desirous of employing an assistant to its present General Superintendent, a man who can become General Superintendent in the shortest possible time. This man should have the necessary construction experience and the ability to work with other job superintendents. The present General Superintendent is the writer of this ad and all answers will be treated in strict confidence. Starting salary $12,000.00 but you can earn more immediately if you are the right man. P-2407 Engineering News Record.

Mechanic or master mechanic with experience on road and bridge contractor's equipment with the ability to eventually take complete charge of contractor's equipment repair shop and mechanics. This is an unusual opportunity salary $12,000.00 per year. P-2411 Engineering News Record.

Mechanical Engineer recent graduate to work in Engineering Office of medium sized chemical company, to work on plant layout, design of buildings and equipment. The Glens Falls area of about 30,000 population is ideally located near Lake George and other vacation and living conditions. Write Personnel Department, Imperial Paper and Color Corporation, Glens Falls, New York.

Supervisory positions for High Dam Construction in India. Former Supervisory employees or those now in supervisory positions who have worked with me on projects in the past and are interested in foreign work. Contact me by letter: M. H. Slocum, 504 East Pine Street, Alhambra, California.

EMPLOYMENT AGENCIES

Wanted Engineers, Designers, Draftsmen-Structural, Architectural, N.E., C. E., E.E., and Ind. also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

Construction Engineer Superintendent. Broad experience all phases waterworks, sewage, bridge, tunnel, industrial and heavy construction activities. Available September for field supervision construction for owner or contractor. Good organizer. Mature judgment. Registered Civil. Age 56. PW-2298, Engineering News-Record.

City Engineer and Building Commissioner of city of 35,000 in Illinois desires to make change, South preferred. Sixty-six years old, many years service Federal, State and municipal. Qualified for above jobs or city manager. Hold Illinois license, member American Society of Civil Engineers. PW-2377, Engineering News-Record.

Chief Auditor—Chief Accountant seeking new connection with reputable firm. Twenty years in above positions with leading engineering and construction firms in charge of finances, costs and administrative details. Experience covers large joint-venture, government and industrial cost plus projects. Also broad experience on heavy construction unit price projects. Now employed but desire change where experience may be more fully utilized. References and bond, will consider any location. PW-2376, Engineering News-Record.

Construction Management, Project Superintendent, Superintendent 15 years experience in all phases of building construction, public works, housing and industrial work, specializing in concrete construction. Age 35—will relocate. PW-2349, Engineering News-Record.

Construction executive, 33, B.S., general manager, estimator, thoroughly experienced industrial, commercial construction. Location immaterial. PW-2181, Engineering News-Record.

Construction Engineer—Executive over 25 years on all types of construction also cost engineering. Over 10 years in South America, know Spanish. Interested in top flight job only. Foreign assignment preferred. PW-2363, Engineering News-Record.

Construction Executive, Sound field and office experience on Buildings and heavy construction, qualified to handle all phases of contracting, seeks new connection as project manager, chief estimator or similar position requiring top man. Now employed. Minimum $15,000. PW-2240, Engineering News-Record.

POSITIONS WANTED

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P-2453, Engineering News-Record
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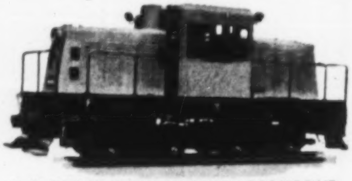

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Amer. Mutual Liability Ins. Co. ... 60, 61
Amer. Vitrified Prod. Co. ... 5
Armco Drainage & Metal Prod., Inc. ... 59

Belmont Iron Wks. ... 74
Bethlehem Steel Co. ... 102
Butler Mfg. Co. ... 65
Byers Co., A. M. ... 2nd Cover

Caterpillar Tractor Co. ... 29
Chicago Pneumatic Tool Co. ... 30, 31
Cities Svc. Oil Co. ... 94
Clow & Sons, James B. ... 64
Committee on Steel Pipe Research ... 73
Connors Steel Div. H. K. Porter Co. ... 53
Craftsman Book Co. of America ... 76
Curtiss-Wright Corp. ... 79

Dewey & Almy Chemical Co., Div. W. R. Grace & Co. ... 56, 57
Douglas Fir Plywood Assoc. ... 54
Dravo Corp. ... 76
Dudgeon, Inc., Richard ... 74

Economy Bldgs., Inc. ... 77
Ellicott Machine Corp. ... 71

Federal Telephone & Radio Corp. ... 4
Fennel Instr. Corp. of Amer. ... 36
Foundation Services Inc. ... 72

Gar Wood Ind., Inc. ... 82
Goodyear Tire & Rubber Co. ... 1
Griffin Wellpoint Corp. ... 75
Gulf Oil Corp. ... 91
Gunite Concr. & Const. Co. ... 77

Horn Co., Inc., A. C., Div. of Sun Chemical Corp. ... 104

Irving Subway Grating Co. ... 96

Jenkins Bros. ... 16

Larsen Prod. Corp. ... 72
LeRoi Co. ... 43
Leschen Wire Rope Div., H. K. Porter Co., Inc. ... 10
Louisville Cement Co. ... 93

Mahon Co., R. C. ... 44
Master Bldrs. Co. ... 3rd Cover
Maxon Const. Co. ... 67
Mayo Tunnel & Mine Equip. Co. ... 74
McKiernan-Terry Corp. ... 88

National Gypsum Co. ... 68
National Tube Div., U. S. Steel Corp. ... 101
Naylor Pipe Co. ... 45
Northwest Engineering Co. ... 3

Pennsylvania Drilling Co. ... 87
Phoenix Bridge Co. ... 77
Pittsburgh Corning Corp. ... 12, 13

Reo Motors, Inc., Ind. & Marine Eng. Div. ... 6, 7
Republic Steel Corp. ... 38, 39
Roebling's Sons Corp., John A. ... 18
The Ruberoid Co. ... 106
Ryerson & Sons, Inc., Jos. T. ... 87

St. Paul & Tacoma Lumber Co. ... 58
Schramm, Inc. ... 52
Servicised Prod. Corp. ... 85
Shawnee Mfg. Co., Inc. ... 11
Smith Co., S. Morgan ... 81
Spencer, White & Prentis, Inc. ... 88
Superior Concr. Accessories ... 14
Symons Clamp & Mfg. Co. ... 2

Templeton Kenly & Co. ... 87
Texas Co. ... 4th Cover
Timken-Detroit Axle Div., Rockwell Spring & Axle Co. ... 46, 47
Timken Roller Bearing Co. ... 8

U. S. Rubber Co. ... 20
U. S. Steel Corp. ... 37

Washington Aluminum Co., Inc. ... 66
Weil Pump Co. ... 69
Whiteley Bearing Co. ... 77
Wild Heerbrugg Instr., Inc. ... 66
Wooldridge Mfg. Div., Continental Copper & Steel Ind., Inc. ... 15

Youngstown Sheet & Tube Co. ... 89

Professional Services ... 118

CLASSIFIED ADVERTISING

F. J. Eberle, Business Mgr.

Employment Opportunities ... 109-113
Educational ... 113
Proposals ... 106-108
Equipment (For Rent, Sales Wanted) ... 113-118

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Editorials

Furthering Modular Measure

Several steps taken in recent weeks will do much to further the cause of dimensional standardization of building materials. Progress of modular coordination has been lagging; but this new rush of activity indicates there still is much life in the movement.

Most significant developments are: (1) The Associated General Contractors of America joined the American Institute of Architects, the National Association of Home Builders and the Producers Council as an official sponsor of modular coordination; (2) The Producers Council began to organize a Modular Building Council, to enable individual architects, contractors and manufacturers to take an active part in dimensional standardization; (3) Most recently, PC and NAHB held a joint meeting to determine practical standards for dimensioning windows and window openings.

The last action is probably the most significant because it offers hope that something more than just talk may result. Representatives of the Aluminum Window Manufacturers Association, the National Woodwork Manufacturers Association and the Steel Window Institute attended the meeting, and a plan of action was decided on. After NAHB's Research Institute determines which window sizes are generally preferred by builders, standards will be established to enable manufacturers to mass produce them.

Use of modular size windows in conjunction with modular wall materials could eliminate much on-site cutting, fitting and fabrication, with consequent saving in cost. Modular window progress is good news because it may stimulate manufacturers of other products to increase activity on modular standardization.

Tollroads for Profit

Disturbing implications are contained in a Maine newspaper's recent feature story which suggests that the Maine Turnpike is too profitable a venture ever to be permitted to become a free road.

True enough, the spectacle of a self-liquidating public project that is never liquidated is not new: The bridges and tunnels of the Port of New York Authority and the San Francisco Bay Bridge are ready examples. In these cases revenues from existing facilities are applied to construction of other public facilities, such as more bridges and tunnels, better approaches, terminals to relieve street congestion and the like. It is at least arguable whether such use of toll revenues is right or wrong.

But what the Portland Press-Herald puts forth is something quite different: It proposes that tolls be kept on the turnpike after its bonds have been retired, in order to produce revenue for the state.

"In effect," comments the newspaper, "the people of Maine would be enjoying (if tolls were maintained) the income from a staggering $78.6-million investment of someone else's money." And the article goes on to point out that income from the turnpike could reach $10 million a year.

Despite its attractiveness from the viewpoint of the local taxpayer, we repeat that's a very disturbing thought. Such action would in fact be putting the state in business for a profit—with no excuse that it was recouping expenses. And that suggests possibilities such as holding back other road construction so as not to interfere with a good money-maker supplying a good part of the state's income.

The reason for toll construction of any well-planned highway is basically a needed public convenience that can be built faster by toll financing than by normal methods. It is not for the purpose of making a profit out of a public facility.

Aiding National Defense

Design and construction of a complex structure for testing rocket engines (see page 40) dramatically emphasizes the part the construction industry plays in the national security of the U. S. Exact nature of weapons to be developed with the aid of this facility cannot be revealed. But it is no secret that at the present stage of world tensions, development by the U. S. of advanced missiles systems will help keep the cold war from turning hot.

It is deplorable that a large percentage of our national effort must be devoted to developing new weapons. But that is one of the facets of life in this decade of the 20th century. No one can say which instrument of warfare can prevent an active war. It might be an atomic-powered airplane or an intercontinental ballistics missile. Whatever it is, the construction industry will have played an indispensable part in its development.

The Edwards Air Force Base rocket test stand could not have been built without the services of engineers and contractors. Civil, structural, electrical and mechanical engineers were needed to transmute the desires of rocket scientists into buildable plans. Contractors of several types had to rely on previous experience to construct an installation of a new and different nature. And it requires no stretch of the imagination to assume all this had to be done on an accelerated time schedule which presents even more complex challenges to the engineer and builder.

When the full story of our current weapons development programs is told, the atomic and rocket scientists, the test pilots and the military brass will be glamorized. But in the final analysis the contribution of the construction industry to this part of our national security cannot be overestimated.

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(*left*) Heavy-duty plant-mixed Texaco Asphalt pavement on Melrose Avenue, Roanoke, Va. Used by traffic to by-pass the center of the city.

(*right*) U. S. Route 11, near Cloverdale, one of Virginia's principal north-south highways, also paved with heavy-duty plant-mix Texaco Asphalt.

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